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PRESIDENT ROOSEVELT ON THE NAVY.

President Roosevelt is at present making a tour of the New England states. He has made a number of little speeches along the way, one of which was devoted almost entirely to the United States navy. The president has always taken a vital interest in the navy. During the early part of the Spanish affair he was assistant secretary of the navy organized the famous mosquito fleet which did excellent service. In his naval speech he said:

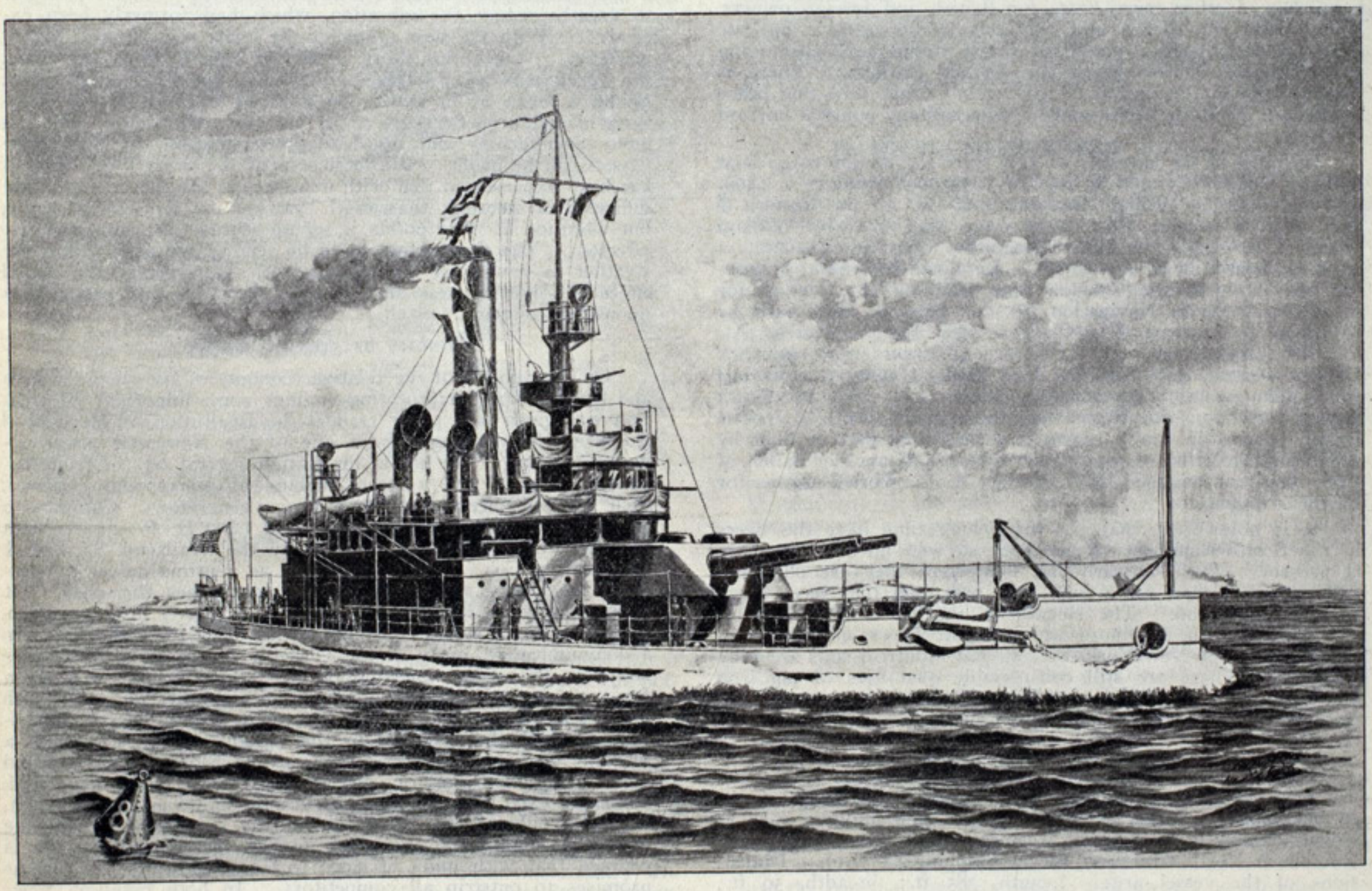
"The entire country is vitally interested in the navy, because an efficient navy of an adequate size, is not only the best guarantee of peace, but it is also the surest means for seeing that if war does come the result shall be honorable to our good name and favorable to our national interests. Any really great nation must be peculiarly sensitive to two things: stain on the national honor at home and disgrace to the national arms abroad. Our honor at home, our honor in domestic and internal affairs is at all times in our own keeping and depends simply upon the national possession of an awakened public conscience. But the only way to make safe our honor as affected, not by our own deeds but by the deeds of others, is by readiness in advance. In three great crises in our history during the nineteenth century—in the war of 1812, in the civil war and again in the Spanish war—the navy rendered to the nation services of literally incalculable worth. In the civil war we had to meet antagonists even more prepared at sea than we were. On both the other occasions we encountered foreign foes, and the fighting was done entirely by ships built long in advance and by officers and crews who had been trained during years of sea service for the supreme day when their qualities were put to the final test.

"It was this preparedness which was the true secret of the enormous difference in efficiency between our navy and the Spanish navy. There was no lack of courage and devotion among the Spaniards, but on our side, in addition to the courage and devotion, there was also that training which comes only as the result of years of thorough and painstaking practice. Annapolis is, with the sole exception of its sister academy at West Point, the most typically democratic and American school of learning and preparation that there is in the entire country. There each man enters on his merits, stands on his merits and graduates into a service where only his merit will enable him to be of value.

"The enlisted men are of fine type, as they needs must be to do their work well, and out of the fine material thus provided the finished man-of-war's-man is evolved by years of service. It is impossible after the outbreak of war to improvise either the ships or the men of a navy. The ship builders and gun makers must keep ever on the alert so that no rivals pass them by, and the officers and enlisted men on board the ships must in their turn, by the exercise of unflagging an intelligent zeal, keep themselves fit to get the best use out of the weapons of war intrusted to their care. The instrument is always important, but the man who uses it is more important still.

"We must constantly endeavor to perfect our navy in all its duties in time of peace, and, above all, in maneuvering in a seaway and in marksmanship with the great guns. In battle the only shots that count are those that hit, and marksmanship is a matter of long practice and of intelligent reasoning. A navy's efficiency in a war depends mainly upon its preparedness at the outset of that war. We are not to be excused as a nation if there is not such preparedness of our navy. No nation has a right to undertake a big task unless it is prepared to do it in a masterful and effective style. It would be an intolerable humiliation for us to embark on such a course of action as followed from our declaration of war with Spain and not make good our words by deeds—not be ready to prove our truth by our endeavor whenever the need calls. The good work of building up the navy must go on without ceasing. The modern warship cannot with advantage be allowed to rust in disuse. It must be used up in active service even in time of peace. This means that there must be a constant replacement of the ineffctive by the effective. The work of building up and keeping up our navy is therefore one which needs our constant and unflagging vigilance.

"Our navy is now efficient; but we must be content with no ordinary degree of efficiency. Every effort must be made to bring it ever nearer to perfection. In making such effort the prime factor is to have at the head of the navy such an official as your fellow-townsman, Mr. Moody, and the next is to bring home to our people as a whole the need of thorough and ample preparation in advance; this preparation to take the form not only of continually building ships, but of keeping those ships in commission under conditions which will develop the highest degree of efficiency in the officers and enlisted men aboard them."



Monitor Nevada on her trial trip. Length over all 255 ft ; length on water line 252 ft ; beam, 50 ft.; draught complete, 12 ft 6 in.
Drawing copyrighted by N. J. Quirk

SHIP BUILDING AND SHIPPING IN SCOTLAND.

Glasgow, Aug. 23.—There is a dulness in the ship building industry not unusual at this time of year, but which is causing some anxiety in labor circles. Unless there is a "spurt" of new orders within the next few weeks there will be a considerable decrease in employment during the winter months, for contracts booked last year and in the earlier months of this year are rapidly approaching completion. In July, which is a holiday month in Scotland, the output of the Scotch yards was nineteen vessels of 32,022 tons, as compared with twenty-six vessels of 47,900 tons in June, and with twenty-seven vessels of 53,000 tons in July 1901. The Clyde proportion was fourteen vessels of 27,690 tons. The total for the seven months ended July 31, was 331,800 tons.

While the remark above made about the dulness of ship building is general as applied to the whole country, it should be explained that the ship builders of Scotland are much better off in the matter of work on hand than are the builders in the rest of the United Kingdom. Thus while they turned off the stocks last month 32,000 tons they booked in the same period new orders to the extent of 45,000 tons, or 13,000 tons more than their output. The new contracts included two twin-screw boats for the Thompson line of Australian steamers, each of 6,700 tons, to be built by Alexander Stephen & Sons; a 7,500-ton cargo boat to be built by Napier & Miller, for Glasgow owners; a 7,000-ton cargo steamer to be built by Charles Connell & Co., for Liverpool owners; two large floating docks to be built by William Hamilton & Co., Port-Glasgow, for Rotterdam; and a number of other cargo boats for British and foreign owners. The general run of the new contracts would seem to indicate some renewal of the demand for cargo tramps, notwithstanding the continued depression of the freight markets. There is evident faith in the revival of the world's trade, now that peace is attained in South Africa and the international political horizon is clear.

Included in the launches of July were a 7,300-ton cargo boat built by Charles Connell & Co., for Liverpool owners; a 4,500-ton boat built by William Beardmore & Co. for the Eastern & Australian Steamship Co.; a 4,400-ton boat built by William Denny & Bros., for the Union Steamship Co., New Zealand; a 4,000-ton boat built by Russel & Co. for Spanish owners; a 2,000-ton boat built by the Caledon Ship Building Co., Dudee, for the General Steam Navigation Co.; a 1,850-ton boat built by Murdoch & Murray, Port-Glasgow, for Buenos Ayres. Altogether, 11,390 tons were for Liverpool owners, 7,000 tons for London owners, 4,400 tons for New Zealand owners, 2,000 tons for Italian owners, 1,900 tons for Wales, 1,850 tons for South America, 760 tons for Russia and the rest for Scotland. The Italian proportion was a 2,000-ton steel sailing barque, built by Archibald McMillan & Son, Dumbarton, and another sailer of 1,960 tons was launched by A. Rodger & Co., Port-Glasgow, for Cardiff owners.

It is noteworthy that not for a long time have the liners in the Scotto-American service been so well filled as they are at present. Both outward and homeward they are obtaining fuller cargoes than for a long time past, and they have cargo booked well ahead. The Donaldson line has resumed regular service both with Baltimore and Newport News, and the various liners on the New York, Boston, and Montreal runs are fully occupied. There are still considerable quantities of pig iron and steel (both crude and manufactured) waiting shipment from this side to the United States and Canada.

VESSELS OF SPECIAL INTEREST.

A vessel of special interest for Americans was lately launched by Napier & Miller. Ltd., from their ship building yard at Yoker, namely, a steel screw steamer built to the order of the Norfolk & North American Steam Shipping Co. Ltd. Dimensions of the vessel are: Length, 385 ft.; breadth, 50 ft.; depth, molded 28 ft. 5½ in., with a gross tonnage of about 4,300 tons, and deadweight carrying capacity of about 6,800 tons. The vessel is so fitted as to suit the Manchester canal, with all the latest improvements for the rapid handling of cargo. Dunsmuir & Jackson, Glasgow, supply the engines. The steamer will run in the Arrow Line between New York, Leith and Dundee, and is a sister ship to the South Point, recently built by same builders for the same owners. As the vessel left the ways she was named Orient Point. This is the tenth vessel that the Norfolk company has launched, the last two of which have been constructed in Scotland.

A new fruit steamer has just been launched from the Grangemouth yard of the Grangemouth & Greenock Dock Yard Co., namely, the steamship Siva, built for Messrs. J. T. Salvesen & Co. of Grangemouth. The Siva is of the following dimensions: 270 ft. between perpendiculars, by 37 ft. by 20 ft. 6 in. molded. She is classed 100 A1 at Lloyd's, is of the single-deck type, and has poop, bridge and forecastle deck of teak. The frames are of the bulb-angle section, thus dispensing with reverse frames. She has been specially built to suit Messrs. Salvesen's fruit trade, and has a total capacity of 2,500 tons on a draught of 17 ft. The engines supplied by S. & H. Morton & Co., Leith, are of 1,600 H. P., to drive the ship when loaded at a speed of 11 knots. There are two boilers of extra large size to provide ample supply of steam under all conditions, with spar tail shaft, evaporator, feed heater, filter, and all modern appliances. The vessel is well equipped for quick and economical working of ship and cargo, including ample water ballast, grain shifting boards, double derricks, steam steering gear, quick warping steam windlass, electric light, steam heating, awnings, extra ventilation throughout with a view to the carriage of fruit and other perishable cargoes, four large steam winches, and donkey boiler of the horizontal multitubular type.

Mr. A. B. Mackay of Hamilton, Ont., has ordered from Russel & Co. of Port-Glasgow, a 2,000-ton steamer, for the great lakes traffic. The dimensions of the vessel are to be 230 ft. by 37 ft. by 16 ft. molded to the shelter deck, and above that there will be 7 ft. 6 in. awning deck. Mr. Mackay is negotiating for another vessel of similar dimensions, and also for a third steamer of about 360 ft. in length for the lakes freight trade. The latter vessel will be built in sections. She will go out across the Atlantic under steam, and then be disconnected, and afterwards put together again on the lakes.

SCREW PROPELLER TESTS.

With regard to screw propellers and the tests now being undertaken by the admiralty, it is interesting to note the results got with the Chateaurenault, a French protective deck cruiser. She is a vessel of 8,000 tons displacement, with express water-tube boilers, and three sets of engines which collectively develop over 23 knots. Originally, her three propellers had each three blades. The central screw while on trial got one of its blades broken, and when a new propeller was being made it was decided to make it with four blades. The result was to greatly reduce the vibration, which had formerly been excessive. With the new propeller the trials also showed higher efficiency. Over the short measured course, with the wind, the speed was 24.19 knots, and against the wind 23.88 knots, giving a mean of 24 knots. In most of the British war ships three-bladed propellers are used, but the treble-screw ship has many peculiarities and no deduction applicable to twin-screw vessels can be made. With cruisers of the Good Hope class it has been experienced that with a following sea there is not only difficulty in steering, the vessel "yawing" in her course badly, but vibration at some points is set up so that the compasses are affected. The Good Hope is to be sent to sea again when the weather is rough, so as to test with vibrometers the actual effect of following seas on the ship's structure, and particularly upon the compass.

ECONOMY OF STEAM TURBINE.

On the subject of the relative economy of the steam turbine and the ordinary reciprocating engines, some important information was given in a paper read at the Institution of Mechanical Engineers by the engineer of one of the Newcastle electrical-power stations. He has at his station several sets of triple-expansion engines and a steam turbine of corresponding power, each coupled direct to a three-phase generator. Comparison was made between the turbine set and 1,400 H. P. engines with special Corliss valves, constructed by the Wallsend Slipway & Engineering Co. It is claimed that as a prime mover of electrical machinery the steam turbine approaches the ideal. It runs steadily, is free from vibration and needs little attention. The question of steam consumption has been the difficulty. In a communication made at the Glasgow Congress of Engineers last year the steam consumption per kilowatt hour was given for a number of turbines. The figures steadily improved with the size of the machine. The Newcastle turbine bears comparison best with that supplied by the Parsons Co. to Elberfeld—a machine of 1,000 kilowatts output. The Elberfeld set required over 19 lbs. of steam for each kilowatt of electricity generated, while the 1,500 kilowatt set at Newcastle shows an improvement, requiring only 18 lbs. of steam for the same power; but the Wallsend engines do the work for 17 lbs. of steam. It is claimed that with units of 3,000 to 6,000 kilowatts the turbine promises to outstrip all competitors. In both cases at Newcastle the steam is superheated to the extent of from 75 to 90°.

WILL HAVE POWERFUL BATTERIES.

The Connecticut and Louisiana, two new battleships authorized by the last naval appropriation bill, will carry the most powerful guns, measured by caliber in the world. With the building of each new set of battleships Admiral O'Neil, chief of the bureau of ordnance, has tried to increase the power of the main batteries, and for the Connecticut and Louisiana he intends to increase the length of the big turret guns to 45 caliber. Heretofore the longest naval guns built have been only forty times their caliber in length. Not only will this lengthening of the guns increase their efficiency as to range and velocity, and therefore penetrating power, but it will constitute, it is expected, a distinct advantage to the ships. The muzzles of guns of 40 caliber, when swung broadside, just reach the rail, and the side blast when fired, prevents the use of secondary guns immediately below. By increasing the length the muzzles of the guns are carried well outboard. Some improvements also will be made to secure higher initial velocity. The bureau of ordnance is designing some new sites for turret guns which will combine open, telescopic and day and night sights in a single mechanism. It may be that the guns of the Louisiana and Connecticut will be equipped with them.

STEEL CORPORATION NOT A MONOPOLY.

To prove that the United States Steel Corporation is not a monopoly the American Iron & Steel Association has compiled authentic statistics showing the relationship which the Steel Corporation bears to the steel industry of the United States in general. It shows that the Steel Corporation by no means has a monopoly. It produces, however, more than half the steel of the nation. The article is published in the Bulletin of the American Iron & Steel Association and is as follows:

Statements having frequently been made that the United States Steel Corporation practically monopolizes the production of iron ore, pig iron and finished iron and steel in this country, we have thought it best, once for all, to set before the public the exact facts, which will be found in the following table. With the single exception of iron ore the statistics presented have been carefully compiled from the returns of production made to the American Iron & Steel Association for the whole of the calendar year 1901 by all the constituent companies of the United States Steel Corporation, including the period prior to its organization, and by all other iron and steel manufacturing companies. The statistics of iron ore shipments and production in 1901 have been obtained from the corporation itself and from authentic data contained in our last annual statistical report. All the figures given are complete and absolutely correct; nothing has been estimated.

Iron ore shipments and producti n in the calendar year 1901. Gross Tons.	By Steel Corporati'n	By independent companies.	Total shipment and production.	Perc'tg of steel Corporation.
Shipment of iron ore from the Lake Superior region in 1901	12,692,213	7,897,024	20,589,237	61.6
Total production of iron ore in 1901	12,692,213	16,195 266	28,887,479	43.9
Iron and steel actually produced in the calendar year 1001. Gross Tons.	**Production of plants now of Steel Corporation.**	**Produ - tion by independent com panies.**	**Total production.**	**Percent of plant now of steel Corporation**
Bessemer and basic pig iron	6,460,847	4,584,796	11,045,643	58.5
Spiegeleisen and ferromanganese	190,485	100,976	291,461	65.4
Forge, foundry, and all other kinds of pig iron not included above	152,656	4,388,594	4,541,250	3 4
Total pig iron, including spiegeleisen and ferromanganese	6,803,988	9.074,366	15,878.354	42 9
Bessemer steel fhgots and castings	6,113,588	2,599.714	8,713,302	70.2
Open-hearth steel ingots and castings	2,746,996	1.909,313	4,656,309	59.0
Total Bessemer and open-hearth steel ingots and castings	8.860,584	4,509,027	13,369,611	66.3
Bessemer steel rails	1,719.076	1,151,740	2,870,816	59.9
Structural shapes	629,733	383.417	1,013,150	62.2
Plates and sheets, including black plates for tinning	1,456,897	797,528	2,254,425	64.6
Wire rods	1,059,859	306,075	1,365,934	77.6
All other ro.led products, including bars, skelp, cut nails, open-hearth steel rails. iron rails, etc	1,324,393	3,520,609	4,845,002	27.3
Total of all rolled products	6,189,958	6,159,369	12,349,327	50.1
Wire nails .....Kegs of 100 pounds	6,446,938	3,358,884	9,803,822	65.8

While the above table clearly establishes the fact that the United States Steel Corporation, through its constituent companies, is a producer of iron ore,, pig iron, and finished iron and steel on a stupendous scale, it also just as clearly shows that it is very far from being a monopoly. We need not repeat the percentages that are given in the last column; they tell their own story. That the reader who is not familiar with the iron and steel industries of this country may have a fairly adequate conception of their magnitude we present below a selected list of twenty-five of the largest producers of iron and steel which are in no way connected with the United States Steel Corporation and which are now operating their plants to their full capacity. A list of all the independent manufacturers would occupy too much space. At present and for some time to come this country will need all the iron and steel that the United States Steel Corporation and all the independent companies can make.

Republic Iron & Steel Co.—Twenty-seven rolling mills and steel works and seven blast furnaces; also car axle works, coal mines, coke ovens, iron ore mines, etc.

Crucible Steel Co. of America—Eleven rolling mills and steel works; also three blast furnaces and a steel plant now being erected by an auxiliary company.

Cambria Steel Co.—Rolling mills, steel works, six blast furnaces, ore mines, coal mines, coke works, etc.

Pennsylvania Steel Co.—Rolling mills, steel works, bridge-building plant, seven blast furnaces, ore mines, etc.

Maryland Steel Co.—Rolling mills, steel works, four blast furnaces, ship building works, coke ovens, etc.

Bethlehem Steel Co.—Steel works, rolling mills, forging plant, armor plate plant, and four blast furnaces.

Jones & Laughlin Steel Co.—Rolling mills, steel works, five blast furnaces, chain works, ore mines, coal mines, coke ovens, etc.

Lackawanna Steel Co.—Steel works, rolling mills, and blast furnaces now building at Buffalo to replace similar enterprises at Scranton.

Phoenix Iron Co.—Steel works, rolling mills, bridge-building works, foundry, iron ore lands, etc.

Empire Steel & Iron Co.—Ten blast furnaces, iron ore mines, coal mines, coke ovens, etc.

American Iron & Steel Manufacturing Co.—Four rolling mills, three bolt, nut, and rivet works, etc.

Reading Iron Co.—Four rolling mills, tube works, forge and foundry departments, and two blast furnaces; also ore mines, coal lands, etc.

Thomas Iron Co.—Ten blast furnaces and ore mines.

Lukens Iron & Steel Co.—Steel works, and three large plate mills; also coal lands.

Brandywine Rolling Mills & Viaduct Iron Works.—Steel works, plate and sheet mills and tube works.

Susquehanna Iron & Steel Co.—Five rolling mills, one tube plant building, and two active blast furnaces.

Central Iron & Steel Co.—Three rolling mills (one leased to other parties) and two blast furnaces.

American Steel Casting Co.—(Old organization)—Three steel casting plants.

Sharon Steel Co.—Rolling mill, steel works and two blast furnaces; also iron ore mines.

Wheeling Steel & Iron Co.—Four rolling mills and steel works, one tube mill, and three blast furnaces; also coal lands.

Colorado Fuel & Iron Co.—Steel works, rolling mills, five blast furnaces, including two building, ore mines, coal mines, coke ovens, railroads, etc.

Virginia Iron, Coal & Coke Co.—Two rolling mills and steel works, eleven blast furnaces, iron ore mines, coal mines, coke ovens, etc.

Tennessee Coal, Iron & Railroad Co.—Three rolling mills and steel works, twenty blast furnaces, ore mines, coal mines, coke ovens, etc.

Sloss Sheffield Steel & Iron Co.—Seven blast furnaces, ore mines, coal mines, coke ovens, etc.

Union Steel Co.—Steel works and rolling mills about completed, and two blast furnaces building.

HAMBURG SHIPOWNERS' ASSOCIATION.

The report of the directors of the Hamburg Shipowners' Association for the fiscal year just ended shows that the shipping trade was much less active than in the previous twelve months and that the unfavorable state of things was accentuated by the large number of new vessels built and the release of vessels from their engagements as transports owing to the cessation of the Chinese difficulty. Then the shortage in the corn crop in the United States and the wheat crop in Australia sent freight rates tumbling. At the beginning of 1902 the freight rates were nearly 40 per cent. less than they were in the beginning of 1901. The report is of general interest in that it deals with the Morgan shipping combination and shipping subsidies. Upon these points the report says:

"The understanding arrived at between the Hamburg-American line and the North German Lloyd on the one hand and the Morgan trust on the other is an important and highly satisfactory circumstance not only for the owneries concerned in it but for the entire German shipping trade. It has opened a way for the more judicious management of the traffic across the North Atlantic which cannot fail to be of good results financially for the companies, and, what is still more important, the German lines have preserved their independence with regard to the trust in every respect. The agreement shows up more clearly than anything else could have done the position to which the German shipping trade—and especially the two leading lines—has attained in the world's commerce during the last few decades. It is easily understood why this event should not be regarded with so much satisfaction in England. But when certain English journals, in order to console their readers, assert that the progress made by the German ship owneries is attributable in great part to the heavy subsidies they receive from the state, and when they continue to reiterate the assertion in spite of all contradiction and corrction, we feel it incumbent upon us in this document to establish the fact that the state pavs to ship owners no subsidies whatever beyond an allowance for the conveyance of the mails to Eastern Asia, Australia, and East Africa. Navigation bounties in general, such as are granted in France, Italy, Austro-Hungary, Russia, and other countries, and such as are proposed to be paid in the United States do not exist in Germany. Recommendations have been recently made in England by such men, for instance, as the former chief of the statistical department of the board of trade, that the English shipping trade should be preserved by means of high subsidies in the special sense of the word and by the exclusion of foreign flags from the trade between the motherland and her colonies—which would mean a return to the principles of the navigation laws repealed fifty years ago—but our respect for British shipowners will not permit us to believe that they have so completely lost confidence in their own abilities as to accept such a doubtful boon."

The United States lighthouse board has awarded the contract for the construction of the twin-screw steel steam lighthouse tender Crocus to the Townsend & Downey Ship Building & Repair Co., Shooter's Island, N. Y. The Crocus was recently described in the Review. She is intended for service in the tenth lighthouse district, which includes Lakes Ontario and Erie with headquarters at Buffalo. When completed she will be one of the finest vessels in the lighthouse service.

BRITISH SHIPPING MATTERS.

KAISER WILHELM II. LOOKED UPON AS THE FINEST VESSEL IN THE WORLD—GERMANY INVESTIGATING SUBMARINES—THE BRITISH GOVERNMENT AND THE SHIPPING COMBINATION.

[From our London Correspondent].

London, Aug. 23.—On Tuesday last the Vulcan Ship Building Co. of Stettin launched what is undoubtedly the fastest and largest vessel in the world. Although the Celtic may exceed the new boat by 800 tons, yet in length, depth, displacement, without reckoning cargo, in the space for passengers, in machinery and power, the new North German Lloyd twin-screw steamer Kaiser Wilhelm II. will be lord of the ocean. The new ship is 706 ft. 6 in. long, 2 ft. 6 in. more that the Oceanic, 6 ft. 6 in. more than the Celtic, while the nearest approach amongst the notable fast vessels is the Deutschland with 684 ft., the Kronprinz Wilhelm of 663 ft., and the Kaiser Wilhelm der Grosse of 648 ft. 7½ in., all Vulcan company's creations. Our Campania and Lucania are each 622 ft. long. The breadth of the new ship is a big step in advance, being 72 ft., and although this is 3 ft. less than the Celtic, it must not be forgotten that the latter vessel was built with an eye to a great cargo capacity rather than to high speed. The Oceanic was a lean ship—68.4 ft. wide—narrowness being ever a characteristic of the Harland model. The Deutschland is 67 ft., and the other competitors of the new liner slightly less. Moulded depth is a measurement which varies little, but what is of more importance is that the Kaiser Wilhelm II. has one deck more than her predecessors. Thus, within the moulded structure there are the usual four decks, and above the upper deck there is a spar deck running from bow to stern, then the forecastle, promenade deck and poop, and over this an upper promenade deck 530 ft. long, which extends over the poop—a new feature in ship arrangements—and over this again is the boat deck, whereon there are a number of cabins and saloons for the officers. The promenading space is thus very considerable. The gross tonnage cannot be worked out until the vessel is ready for final measurement, but it is calculated at 20,000 tons whereas the Celtic works out to 20,880 tons, the Oceanic to 17,274 tons, the Deutschland to 16,502 tons, and the other fast ships down to the 12,500 tons of the Campania and Lucania. The displacement of the new ship, without cargo, but with passenger supplies and the 5,600 tons of coal which her bunkers are proportioned to carry, will be about 26,000 tons so that she far excels our great battleships and cruisers of 16,300 tons and 14,200 tons respectively. Although the Celtic and Oceanic, when their immense holds are filled up, often displace more, cargo can scarcely be reckoned when any comparison of the ships is being made. The machinery, however, occupies by far the greater part of the interior, for, apart from the great bunkers to take the 5,600 tons of coal, there are four boiler compartments and four enginerooms. The machinery, which is to indicate 40,000 H. P., includes four separate sets, two being utilized for driving each screw propeller. Each of the engines is of the quadruple-expansion type, but the high-pressure cylinder is placed on top of the first intermediate pressure cylinder, and thus works through the same connecting rod on the same crank, so that there are three cranks for each engine, or six cranks to the two engines working on the same shaft. All four sets of engines are in separate compartments, formed by longitudinal and thwartship bulkheads, and the arrangement of cylinders to each other secures all the advantages of the Schlick system of balancing. The high-pressure cylinder of each engine is 37½ in diameter, the first intermediate of 49¼ in., the second intermediate of 74¾ in., and the low-pressure cylinder of 112¼ in. diameter. The stroke in each case is 70¾ in. By thus dividing the engines into four units the power to be developed by each is only 10,000 I. H. P., but the use of only two shafts and two screw propellers involves the transmission of a larger power through shafting than has ever before been attempted. Each shaft carries practically 20,000 I. H. P. It is made of nickel steel, and forms a most interesting part of Krupp's display at the Dusseldorf exhibition. The thrust shaft is 25 in. in diameter, and the propeller shaft is 25½ in., both of them hollow. There are nineteen boilers in the ship, which have four funnels, as is the case with the three predecessors for the Atlantic from the same slip. These funnels will rise to a height of over 130 ft. above the keel plate. Twelve of the boilers are double-ended, and seven of them are single, so that there are in all 124 furnaces. The boilers are expected to give sufficient steam for the 40,000 I. H. P. without resorting to force draft, an open stokehold, with large cowls, being provided. The Kaiser Wilhelm II. is expected to sail by April next.

THE GOVERNMENT AND THE COMBINE.

It almost looks as if the British government is not going to make terms with the Morgan Atlantic combine if it can help it. It is doubtless known to your readers that J. Pierpont Morgan undertook to let those vessels under his financial control still flying the British flag continue so to do and be at the call of the British government in case of war. But the difficulty, not to mention the dignity, of a government relying upon vessels owned by foreigners in time of war, is obvious. The admiralty has now invited the leading steamship companies not connected with the Morgan combine to supply lists of any vessels which they may have already, or which they may contemplate immediately building, suitable for conversion, if necessary, into armed cruisers. This means, if it means anything, that the British admiralty will endeavor to utilize the other resources of the shipping world before applying to Mr. Morgan.

MAIL STEAMERS AS ARMED CRUISERS.

In the current number of the Empire Review there is an article by Lord Brassey on the subject of state aid to mercantile cruisers. Lord Brassey considers that this is the most effective plan of providing scouts to act as eyes of the fleet in time of war. Comparing Great Britain with foreign countries as regards the number of suitable vessels to serve as auxiliary cruisers, his lordship points out that the ocean-going steamships of the world with a speed of 20 knots and over, total twenty-eight, of which only seven are under the British flag. The ships which carry the mails across the ocean under the British flag should, he says, be second to none in power and speed. In late years our shipowners have made no effort to compete with the record breakers of Germany. The building and running of such vessels lie beyond the scope of the strongest private firms. We cannot have such vessels without payment. It is hardly going too far to say that the policy of giving subsidies to mercantile auxiliaries is to some extent imposed on the British government by the action taken by other powers. All the leading naval powers of Europe give liberal subsidies for the building and running of mail steamers convertible into cruisers. France has led the way. A policy of liberal subsidies for mail steamers has been recommended to congress by President Roosevelt and Mr. Secretary Gage. The conditions upon which subsidies to auxiliary cruisers are granted should be made binding on British owners, as in the case of a subsidized mail service under foreign flags. The vessels should be built with protective armaments, sufficient to ensure a superiority over merchant vessels lightly armed for the interruption of commerce, and the speed should be sufficient to make it possible to overhaul such steamers. Lord Brassey considers we have too many war vessels in commission useless for the protection of commerce, and inferior to modern cruisers of other navies. It is desirable to concentrate our naval force more closely on the main routes of trade, and at important strategical points. This could be done if the vessels employed in carrying the mails were more effective as cruisers. In conclusion, he points out that powerful mail steamers could be used for the training of engineer-officers and stokers.

THE PROPELLER PROBLEM.

The question of vibration in relation to three propellers still awaits solution. It may be interesting, however, to note the results with the Chatteaurenault, a French protective deck cruiser. She is of 8,018 tons displacement with express water-tube boilers and three sets of engines collectively developing over 23 knots. Originally her three propellers had each three blades. The central screw while on trial had one of its blades broken, and when a new propeller was being made, it was made with four blades. The general result was that the vibration was greatly reduced, whilst higher efficiency was obtained, because over the short measured course with the wind the speed developed 24.19 knots and against the wind 23.88 knots, giving a mean of 24 knots. The result was therefore regarded as in every respect satisfactory. In most British ships three-blade propellers are used. In the big British cruisers of the Good Hope class, it has been found that with a following sea there is not only difficulty in steering (the vessel yawing badly) but vibration is set up.

LAUNCH OF A PACIFIC LINER.

The twin-screw steamer Victoria, the latest of the Pacific Steam Navigation Co.'s fleet, of Liverpool, has just been launched by the Fairfield Shipbuilding & Engineering Co., of Govan. The new vessel will ply for service on the Orient Pacific Line to Australia. She measures 417 ft. length, 52 ft. in breadth and 37 ft. in depth. She is 5,350 tons gross, and specially designed for the requirements of the Australian trade. The Victoria is of the spar-decked class and has a cellular double bottom for feed water and water ballast extending throughout the greater part of her length. She marks a departure, inasmuch as her cargo hatches are arranged at the sides instead of in the center line. This arrangement gives two separate hatches to every hold, and facilitates loading and unloading, besides leaving the central part of the ship free for passenger accommodation. It also enables the vessel to carry a very large number of passengers in proportion to her size. The main and spar decks are fully utilized in this way, and in addition there is a promenade deck extending from stem to stern, and above that a boat or shade deck, with rooms for officers and navigation purposes. On the main deck, besides quarters for seamen, firemen, stewards, and engineers, there are staterooms for about 120 second-class passengers, and accommodation for over 140 third class passengers, the majority of whom are in enclosed berths. On the spar deck there are smoking and dining rooms for second-class passengers, with staterooms for thirty second-class and about seventy first-class passengers. A large open space upon this deck is set apart as a third-class promenade. A spacious dining saloon for 130 first-class passengers is arranged on the promenade deck, and a smoking-room and drawing-room are also provided, each lighted from above by large circular stained glass domes in addition to the usual large square side windows. The first-class entrance is situated between the

ranges of large airy state-rooms accommodating forty-two saloon and the drawing-room. On this deck there are also two first-class passengers. Special attention has been paid to the ventilation of the vessel, and the electric light is installed throughout the ship. The steering gear, which is placed aft on the main deck, is of Brown's latest steam tiller type, controlled by hydraulic telemotor from the navigating bridge. The propelling machinery consists of two sets of triple-expansion surface-condensing engines, each set having three inverted cylinders working on three cranks. The high-pressure and intermediate pressure cylinders are each fitted with a piston valve, and each low-pressure cylinder with a double-ported flat-slide valve, all worked by the usual double eccentric and link motion valve gear. Each set of valve gear will be controlled by an all-round steam and hand reversing engine. The crank shaft is in three pieces, each piece being built up and interchangeable, and, together with the thrust tunnel and propeller shafts, are of forged mild steel. Each screw propeller has three blades of bronze, the boss being of cast steel. The engines are fitted with the latest improvements for economical working, including feed heater and a feed filter also a large evaporator for producing fresh water to supply the boilers. A complete system of donkey pumps necessary for the special nature of the service in which the vessel will be employed are also fitted. Steam will be supplied by two double-ended and two single-ended boilers made entirely of steel; each of the double-ended boilers has six Morison's furnaces, and each single-ended three, making a total of eighteen furnaces, and adapted to work at 190 lb. pressure.

RUSSIAN SHIPPING.

The Odessa correspondent of the London Times sends an interesting note on Russian enterprise in the matter of shipping. His statement is to the effect that an Italian company is at present negotiating with the committee of the Russian volunteer fleet with a view to opening up a new regular line between Black sea ports and North America via Italy, by means of volunteer fleet vessels. The Italian company proposes with certain of these vessels to maintain a regular passenger and cargo service between Odessa and Naples, and to make a bid for the emigrant trade between Italian ports and New York. The emigrant traffic between Naples and New York is stated to be at present a heavy one, and the volunteer fleet steamers are well fitted to cope with emigrant transport on a large scale. It is proposed as an experiment to put on the new line two of the vessels of the volunteer fleet now in reserve, the vessels mentioned being the St. Petersburg and Orel, two of the older of the fast vessels of the fleet. The volunteer fleet committee are stated to be anxious to fall in with the Italian company's offer, particularly in view of the fact that a short while ago an opinion was expressed by the authorities that the administration of the volunteer fleet should as soon as possible seriously consider the advisability of widening the field of the fleet's operations by running tonnage on foreign lines. At the present moment a definite plan in regard to an Odessa-Naples-New York service is said to be occupying the attention of the volunteer fleet committee and the Italian company, and a decison in regard to what is undoubtedly a question of the first importance in volunteer fleet and Russian shipping circles generally is looked for towards autumn of the present year. In a subsequent message, the same correspondent adds:

"In addition to the two vessels of the Russian volunteer fleet, the Petersburg and Orel, about which, as mentioned in my communication published in the Times of the 4th inst., negotiations are stated to be on foot between the volunteer fleet committee and an Italian company, it is proposed by the Italian company, to take over for three voyages between Odessa, Naples and New York, one of the vessels of the Russian Steam Navigation Co., the Odessa. The Odessa, which was acquired by the Russian company only four years ago and altered to suit the requirements of emigrant and troop transport to the far east, is capable of accommodating about 1,500 emigrants and has been running almost exclusively on the Odessa-Vladivostok line. The competition set up by the Siberian railway in the emigrant and troop traffic to the far east is stated to have considerably influenced the Russian company in their decision to seek some other outlet for their vessels' capacity outside of Russia. As far as the volunteer fleet is concerned, it is agreed here that some such measure as that stated to be at present under consideration in regard to certain of their faster vessels will have to be adopted by the volunteer fleet committee, who, in consequence of the operation of the Russian flag law of 1901, are faced by a totally different state of things to that which prevailed in the days of their monopoly of Russian trade to the far east."

The enormous coast line of the Russian empire, coupled with the fact that nearly all the great Russian cities are ports, renders it highly probable that, with the economic advance of Russia, greatly increased shipping transit must follow.

It is stated that the German government has at last resolved to take a step with a view to the construction of submarines, and that it is its intention to make a small provision in the next naval estimates to this end. It is proposed at present to build, and probably at Kiel, two boats, the plans for which are already in hand, something after the model of those now under construction in this country.

Under agreement with the Canadian government, the Allan Line, in association with Elder, Dempster & Co. and Furness & Withy, have arranged to run a regular service of steamers between Canadian and South African ports. A steamer of the Allan line will inaugurate the service, sailing from Montreal in October.

In the month of July British ship builders delivered to foreign customers fifteen vessels of 29,691 gross tons, valued in hulls and machinery at £479,626. Only one sailing vessel appear in the list.

LOFTIEST LIGHTHOUSE IN THE WORLD.

The new lighthouse just completed on the Isle Vierge, off the coast of Brittany, has the distinction of being the most lofty yet erected. The new lighthouse stands in close proximity to an older one dating from 1845, which it is intended to replace. L'Ile Vierge is a rocky islet, situated a little to the east of the River Abercrach, which enters the sea on the north side of the headland off which lies Ushant Isle. The old light, which combined a fixed white light with a revolving red light, was deemed of insufficient power, both from its inadequate optical equipment and from its insufficient elevation. It was therefore, says Engineering, decided to replace it by a new light of the first order, with a focal plane 75.18 meters (246.65 ft.) above ground level, or 4.18 meters (13.71 ft.) higher than that of the Balfleur-Gatteville light, and 15.18 metres (49.8 ft.) higher than the famous light at Genoa, which, however, dates from the sixteenth century. The masonry for the new structure was begun at the end of July, 1897, and was finished in a total time of about four years and eight months. The lantern in the meantime had been finished by Messrs. Barbier, and formed a prominent exhibit at the Paris Exposition of 1900. The foundation of the new work is on a granite reef, covered in parts by a sandy bed varying from 2.50 to 3.50 metres (8.2 ft. to 11.5 ft.) in depth. A peculiarity of the masonry lies in the fact that it is constructed of small stones instead of the massive block usual in work executed by the trinity corporation. This procedure was largely due to the fact that the revenues appropriated by the service of the French lights and buoys department is so small that it has been necessary for the engineers to exercise the utmost economy in the details of their design. Up to a height of 3 meters (9.84 ft.) the tower has the form of a truncated cone, 16 meters (52.5 ft.) in the diameter at the base and battered at 1 in 30. The hollow center of the tower is uniformly 5 meters (16.4 ft.) in diameter from base to crown, and is provided with a stairway secured to the wall, the steps, which are 360 in number, being 31.5 in. wide. The masonry of the base up to the 12-meter (39.4 ft.) level is of Brittany granite from the quarries of Kersanton, at which level is commenced the shaft of the tower proper, which rises to a height of 66 meters (216.5 ft.). The diameter of tower at the 12-meter level is 11.40 meters (37.4 ft.), and it tapers down to 7 meters (22.96 ft.) at its summit. The whole external wall of this shaft is faced with Kersanton granite supplied in small blocks, which have in consequence been lifted and placed with great ease. At the top of the tower is a platform of ferro-concrete, supporting the sleeping-room of the attendants. A cornice supported by a series of sixteen small arches completes the tower below the lantern, and adds much to its architectural effect. The platform over the cornice is corbelled out for a distance of 1.5 metres (4.92 ft), and is protected by a granite parapet affording a passage 1 meter (3.28 ft.) wide around the base of the lantern. This passage leads to the masonry block in which is lodged a spiral stairway, giving access to the lenses. The base of the optical apparatus is fixed at a level of 70 meters (229.7 ft.), where it rests on a system of iron beams. The wall is, however, carried up in granite for another 5 meters, and supports at this level the base of the lantern proper. The latter is of the usual type, but, it may be added, that the foot of the lightning conductor in which it terminates is not less than 82 meters (269 ft.) above the base of the tower. As already mentioned, the masonry is in part of Kersanton granite, which had to be conveyed to the site of the tower in boats. This transport could be made in fine weather only, and had to be stopped in winter. The small size of the stones used was, therefore, a great advantage. The rest of the tower is also of granite, but the stone in this case was quarried in L'Ile Vierge itself. The total cost, apart from the optical plant, has not exceeded 300,000 francs, which is very low, considering that the tower was built on an islet difficult of access, to which much of the material used had to be transported in boats and discharged under considerable difficulties at the site of the works, and that the work had to be stopped during winter.

BRANCH OFFICES OF THE MARINE REVIEW.

In view of increased patronage, due to the consolidation of the Marine Review and Marine Record, it has been thought advisable to open branch offices in New York and Chicago. The Chicago office, under the direction of Mr. C. E. Walker, at No. 373 Dearborn street, will be opened during the present week. Mr. Walker has represented the Review in Chicago and surrounding territory for three years past. The New York office will be opened about the middle of the present month when announcement will be made as to location, etc.

NEWS OF THE GREAT LAKES

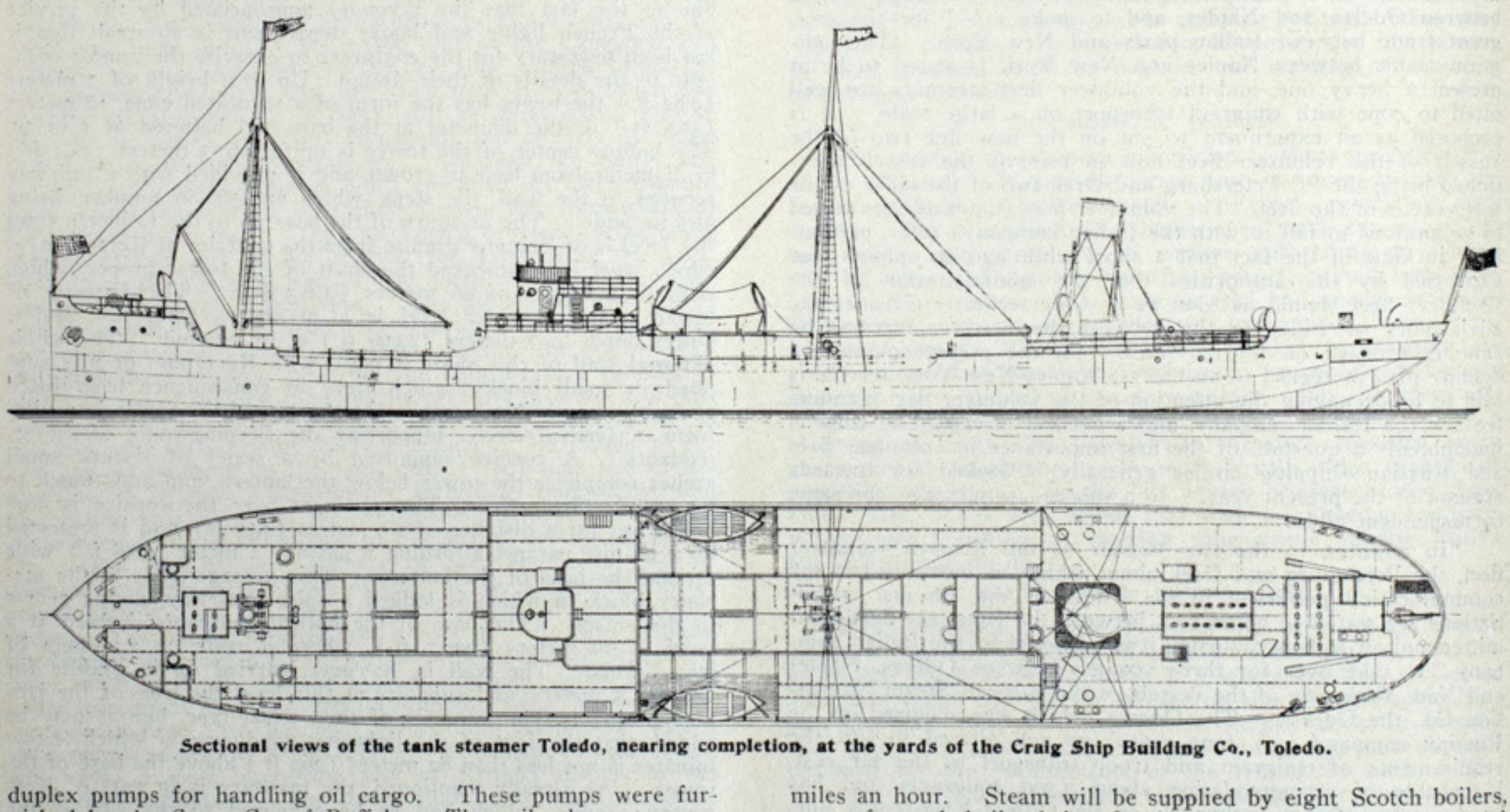
PROGRESS OF WORK AT CRAIG'S

[Staff Correspondence.]

Toledo, O., Sept. 3.—The prosperity which marks the ship yards of the great lakes finds its exemplification in the industry which is to be observed in the yards of the Craig Ship Building Co., Toledo. It is an industry which is not confined to ship construction alone, but which expends itself also in an extension of the plant. During the past year the plant itself has practically doubled in its capacity to produce. A review of the work on hand shows that the company has just launched the tank steamship Toledo for the Sun Co. of Pittsburg, of which Mr. J. M. Pew of that city is president. This tanker is 263 ft. long, 43 ft. beam and 25 ft. deep, with a carrying capacity of 900,000 gallons of oil. She has a triple-expansion engine with cylinders of 21, 35 and 58 in. diameter and a stroke of 40 in. Steam is supplied by two Scotch boilers, 14 ft. 3 in. in diameter and 12 ft. long, each fitted with three corrugated furnaces, supplied by the Lake Erie Boiler Works, Buffalo, N. Y. The vessel is divided into eight cargo tanks, separated from the rest of ship by cofferdams and continually kept full of water. The oil is isolated from the balance of the ship both forward and aft. Aft of the oil cargo space the machinery is placed, together with galley and quarters for engineers' crew. Forward of the oil cargo space is a pumping station supplied with two large duplex pumps for handling oil cargo. These pumps were furnished by the Snow Co. of Buffalo. The sailors' quarters are on the forecastle deck at the forward end of the vessel. The captain's and officers' quarters, as well as the pilot house, are located in the center of the ship. This structure is supported on stanchions in the center and by the hull of the ship at the sides, leaving an air space between the bottom of the structure and the deck of the boat. The Toledo is equipped as an oil burner. An air blast will be used for a spray, the oil being fed by a small air compressor. She is intended to run between Marcus Hook and the Texas oil fields. She has just been launched and will leave for the coast about Oct. 1. The construction of the vessel was supervised by Mr. Edward Gaskin of Buffalo, who designed her for the owners. The Sun Co. is in the business of piping, tanking and transporting oil. It has a sufficient supply already tanked in Texas to keep its vessels in operation for two years. The Toledo is No. 90 on the builder's list and will cost approximately $225,000.

A cargo steamer is also under construction (builder's number 91) for the Monroe Transportation Co. of Detroit, which will be, in a measure, a duplicate of the steamer Thomas Adams, recently turned out from these works. Her dimensions are: Length over all, 285 ft.; beam, 50 ft.; depth, molded, 28 ft. It is expected that she will be launched in January next and will be ready to go into commission by April. She is built on the 3-ft. frame spacing system which gives 9-ft. hatches in place of the 8-ft. hatch generally used in this class of steamers. Her hold is divided into five cargo compartments in order to permit her to carry mixed cargoes of grain. She will have no hull beams and to compensate for the strength in construction lost thereby she will be fitted with webb frames. Her cargo bulkheads too will also make up for strength lost in the omission of beams. This form of construction is intended to facilitate the problem of unloading and is expected to lend itself readily to the automatic unloading machine. There will be two hatches to each bulkhead and no beams to interfere with the grabs of the unloading buckets. Her engines will be triple-expansion, 21, 35 and 58 in. in diameter with stroke of 40 in., supplied by steam from three Scotch boilers, 11½ ft. in diameter and 12 ft. long, allowed 180 lbs. pressure.

The company has just secured a contract to build a car ferry for the Grand Trunk Ferry Co of Milwaukee. Mr. Crosby of the Crosby Transportation Co. is president of this company and controls it, though it is entirely independent of the Crosby Transportation Co. The ferry will be 315 ft. long, 52 ft. beam and 38 ft. deep, and will carry twenty-six cars on four tracks and have accommodation for 1,000 passengers. She will be fitted with twin-screws, each screw being operated by a triple-expansion engine of sufficient size to drive the steamer 15 miles an hour. Steam will be supplied by eight Scotch boilers, 11x11 ft., each boiler being fitted with two Morison corrugated furnaces. It is intended to use only six of the boilers in summer and the entire battery in winter. She will run from Milwaukee to Grand Haven and will crush whatever ice may form by sheer force of weight, her stem being so constructed as to permit her to run up upon it. She will have power sufficient to go through ice a foot thick at the rate of 8 miles an hour. She is to be delivered next July and will cost approximately $350,000.



Sectional views of the tank steamer Toledo, nearing completion, at the yards of the Craig Ship Building Co., Toledo.

The company also has a contract for a full-sized canal steamer, fitted entirely for salt water purposes, but constructed like the ordinary type of lake steamers with engines aft. The company is also to build another oil tanker, practically a duplicate of the Toledo, but further particulars regarding these two vessels are not at present obtainable.

The yards of the Craig Ship Building Co. to-day bear no relationship to what they were a year ago. During that time a 75-ft. addition has been made to the machine shop, and a number of new tools installed. A 60-ft. addition has been made to the foundry and an extra traveling crane added. The entire yard is now operated with electricity from one power station, doing away with all steam engines. The generators and motors were supplied by the General Electric Co. A large pair of

shears has been erected on the dock, capable of handling 100 tons. The dry dock has been increased in length, making it now 525 ft. long, or rather it will be that length when the extension is finished. A new gantry crane, supplied by the Cleveland Car & Crane Co., has been installed over the new building berth, so that all four berths in the yard are now commanded by electric traveling cranes. Two extra railway tracks have been put in and three jib cranes installed for the handling and unloading of material. The company has also put in a complete sheet iron workers' department for making ventilators, light sheet iron work and working in copper pipe for coast service. A new two-story brick office building has also been erected. It is finished in white ash and presents an appearance both rich and tasty. About 600 men are now employed in the yards.

The ship building company has also been instrumental in establishing the Marine Boiler Works upon the grounds adjoining the ship yard. A large shop is now in course of erection at a total cost of $150,000. It will have a complete equipment for the manufacture of marine and stationary boilers, and while the plant is not yet finished it is already in active operation. It is now building the boilers for the cargo carriers and the car ferry. With the addition of the boiler works the ship yard now build everything from the raw material that goes into a vessel. Mr. Clarence Leeper is president of the Marine Boiler Works and Mr. Richard Reeves, general manager. These gentlemen, with the Craigs, make up the company.

The Craig Ship Building Co. was re-organized last January with an enlarged capital. Mr. E. W. Tolerton, a prominent attorney and capitalist of Toledo, joined the company. The organization of the company at present is as follows: John C. Craig, president; E. W. Tolerton, vice-president; George L. Craig, general manager; A. H. Merrill, secretary; John F. Craig, treasurer. These officers, together with Mr. William Wells and Charles Commings, who are both practical men in the ship yard, comprise the board of directors.

BUILDING VESSELS UPON BONDS.

It is not so very long ago, say three or four years, since one of the more prominent men associated with the great lakes trade stopped an acquaintance in the Perry-Payne building at Cleveland, and after a general talk of a few minutes suddenly leaned forward earnestly and inquired: "Say, are you onto this bonding business?" Whenever he had desired to obtain anything it had always been necessary for him to lay down the hard cash, an achievement which is not always possible. He had heard something of the new and mysterious process of finance but had only caught enough of it to excite his wonder and curiosity. It can readily be imagined with what delight he heralded an explanation of the new wrinkle in finance. The "bonding business" has grown to be a considerable factor in the great lakes trade during the past few years, and the honest soul who made the inquiry has himself taken advantage of it several times. It is upon the bond plan that a great many of the lake freighters are to-day being built. When vessels were constructed entirely of wood they were never bonded. In the first place they were small and the capital required to build them was not large; in the second place, and most important of all, their lease of life, as judged by the classification societies, was limited and they were not, therefore, first-class security. When steel was adopted as the material out of which to make ships—and nearly all the vessels building for the great lakes trade nowadays are of steel—there came into existence a ship whose life for all practical purposes was indefinite. The ship afforded in itself a good banking security, because the classification societies were willing to give it a first-class rating for twenty years and to renew the rating upon certain conditions at the expiration of that time. In other words it was a security upon which a bond might be based. Now how might the bond be secured in case the ship went down? This, of course, would be the first question that a banker would ask. It was satisfactorily answered by making the bond a lien upon the insurance as well as upon the vessel. Absolute security was, therefore, obtained. Several trust companies along the great lakes now make a specialty of vessel bonds. The ship is bonded usually to no more than half its value, the other half being supplied in cash by those who propose to build the ship. It usually bears 5 per cent. interest and is an investment which is eagerly sought, owing to its soundness. There is no danger of forfeiture under any circumstances, for if the ship meets with disaster the bonds are cancelled by the insurance; and if she remains afloat it is a sorry season indeed if she cannot easily pay 5 per cent. out of her earnings. This method of finance is now being adopted in coastwise vessel construction, and latterly brokers have written from the east for particulars regarding it.

There is, however, another form of bond which is known throughout the maritime world, and is in general application in all countries. That is the bottomry bond, which, as its name implies, is secured upon the hull of the ship alone. It is in no sense a mortgage. Its sole security is the hull of the ship. Should the ship never reach port again the owner is not required to pay the loan. Money loaned upon bottomry is usually at a high rate of interest, owing to the element of speculation in the security. Should the ship go down the lender has lost his security and his money as well. This form of bond is not as common now as formerly.

THE OLD WITCH OF THE WATER.

The Saginaw Courier-Herald has published the history of the old tug Witch of the West, which, with the exception of the old gunboat Michigan, is probably the oldest craft on fresh water. Fifty years ago this year the keel of the Witch was laid at Petitt's island, N. Y., and at the same time there was laid the keel of a sister craft, which was christened the Stanton. The latter has long since disappeared but the Witch is still doing business. She was first employed on the Atlantic coast and from there was taken to Buffalo where she engaged in the general business of towing. Later she was sent to Toledo. About thirty years ago she was sold to Mosher & Green of Bay City, Mich., where she has been continuously since, though her ownership has changed several times. She was last purchased by Capt. William Gordon of Bay City, who died about two years ago. The Witch is now owned by his widow, Mrs. Mary Gordon of Bay City.

It is reasonable to suppose that many of the timbers that were placed in the hull of the Witch fifty years ago have been replaced from time to time with others. A ship is like a lady's watch, always out of repair, and there is always a lot of work necessary to be done on a tug after she has been doing hard duty for even a single season. The engine in the Witch was built by Neafie & Levy of Philadelphia, is 16x17 cylinder, and of peculiar design compared with the tug boat engines of the present day. On the frame there are hangers for rock shafts to drive a feed pump, also a bilge pump, and in the frame are many bolt holes apparently placed there for the purpose of affording the inquisitive an opportunity to ask questions. They have been there so long that those who might have explained their utility are dead and forgotten, and no one living pretends to know what particular purpose they served. The engine has worn out three boilers, and the fourth one is now in use. It was the proper caper in our grandfathers' days to build machinery that would last a lifetime, a new model every year or two being considered useless expense.

The Witch never carried a crew that did not take pride in the old craft, and when in the spring fitting out she was treated to a new dress of paint, great care was taken in the blending of the colors and the touching up of the stripes, and when the work was done the painters would step off on the dock, light their pipes, take a long and critical squint, and venture the observation: "Well, ain't she a bird." And the service of the Witch has not always been that of merely puffing and pulling away at the end of a tow line. Many and many a dark and stormy night in the fall of the year the Witch has hugged the lee side of the north shore of Saginaw bay or lurked in the vicinity of the Charities waiting for a tow, with the big swells rolling over her decks. And the Witch has worn out a lot of men. Those who were children when her keel was laid are now gray haired, and those who trod her decks forty and fifty years ago have mostly, if not all, dropped anchor in the final home port forever. Captains, engineers and firemen by the score have come and gone, but the toot of the whistle of the old Witch is still a familiar sound along the river, and her prow still plows the placid waters of the sluggish Saginaw.

TURRET STEAMERS FOR THE LAKES.

Toronto, Sept. 3.—As announced in the last issue of the Review, several steamers of the turret type owned by Wm. Petersen & Co., Ltd., of Newcastle-on-Tyne will soon be engaged in the lake trade. Mr. T. R. McCarthy, ship broker of Montreal, and Capt. Thomas Donnelly of Kingston, who is very well known in lake shipping circles, have had charge of the enterprise on this side. Capt. Donnelly has been appointed superintendent of the new line. Offices have been opened in the name of Wm. Petersen & Co., Ltd., in the McKinnon building, Malinda street, this city. Mr. McCarthy will be in charge at Montreal. It is expected that the new line will be in operation by the middle of September, in time to carry a goodly portion of this year's immense crop. To start with, four first-class steel steamers will be put on the route from Fort William and Port Arthur to Georgian bay ports. The names of the steamers are Turret Cape, Turret Court, Turret Crown and Turret Chief. They have each a capacity for 180,000 bushels of wheat, and have a draught of 17 ft. 6 in. Three of the steamers are here and the fourth will leave England in a few days. A gentleman interested in the new enterprise says: "We will be ready in time to handle a portion of the increased western crops via the St. Lawrence. The trade is increasing faster than the facilities for handling it. The steamers which will engage in the trade are classed A1 in inland and ocean Lloyd's and are specially constructed with tank bottoms, and fitted with high-power, modern engines of the most economical type. The vessels are also designed for the rapid and economical handling of cargoes, and are of such safe and suitable construction as to command the lowest insurance rates on hulls and cargoes."

Capt. Chas. Keller, United States engineer announces that a red light is now in position upon the northeasterly extremity of the new detached breakwater at Michigan City. A white light is now maintained upon the eastern end of the old detached breakwater, several hundred feet of which will probably be removed during the coming week.

BIG HARBOR WORKS TO BE READVERTISED.

Maj. Dan. C. Kingman, government engineer at Cleveland, has recommended to the war department that the bids recently opened for the improvement of Cleveland harbor be rejected. Notwithstanding the fact that the work was extensively advertised throughout the country only three bids were received. They were all vastly in excess of the estimate. This was exceedingly surprising to Maj. Kingman, who considered that he had made liberal allowances for extra cost of material and labor and had, in addition, based his estimates upon work at present under construction. For the work at the entrance to Cleveland harbor the excess in cost over estimate was 37 per cent; for the extension of the breakwater itself it was 18 per cent. The estimates were $600,000 for the improvement at the entrance of the harbor and $2,100,000 for the extension of the breakwater. Maj. Kingman was surprised that there should have been no more than three bidders for an extensive work of this character.

"I considered," said Maj. Kingman, "that I could purchase the material, hire the labor and do the work myself well within the estimate. The war department has the authority to order me to do the work but I have not so recommended. I have only recommended the rejection of the bids. I do not consider that the bidders gave sufficient thought and study to the undertaking. The work involves the transportation of 1,500,000 tons of rock alone—an item of sufficient magnitude to make any railway company solicitous for its transportation—yet I do not find that the bidders endeavored to obtain a rate upon it. It is also of sufficient magnitude to induce a bidder to undertake personally the work of quarrying; yet I do not find that they did other than estimate what dealers would charge them for the stone. As the work approximates $3,000,000, it seems to me that there should have been closer and more earnest figuring.

"In readvertising for bids I have decided to ask for alternative bids on a modified form of construction. Some of the bidders seem to think the specifications arbitrary. For instance the specifications provided that to a certain depth stone of 4,000 lbs. weight should be used; and then for a given depth stone not less than 500 lbs. in weight. They construed this to mean that stone weighing 3,000 lbs. would have to be broken up before it could be used, or else rejected altogether. I have recommended the amendment of the specifications to include stone that does not quite approach 4,000 lbs. in weight. The specifications also provided that the core of the breakwater should be of slag or gravel. It so happens, however, that there is a shortage of this material in this neighborhood and it is consequently somewhat more expensive. I have recommended that as long as the core will be kept solid and compact by other material that it may be built of sand of which there is an inexhaustible quantity in Cleveland. The whole city of Cleveland is built upon it and if sufficiently substantial for a city it is certainly sufficientlv substantial for a breakwater. It will, in my judgment, answer the purpose just as well as gravel or slag. With these modifications we will see whether the alternative bid is worth accepting. We could not accept the bids submitted without curtailing the length of the breakwater from 10,000 to 7,000 ft."

AT HEAD OF THE LAKES.

Duluth, Minn., Sept. 3.—At the close of last week there were in store in grain elevators at the head of Lake Superior but 368,000 bushels of wheat, less than at any time since records have been kept. There has been a good demand for wheat from eastern millers and exporters and receipts of new wheat have not commenced to come in appreciable quantity. It is expected that receipts of both wheat and flax will be large another week. So much coarse grain is expected at the head of the lakes this year that special arrangements will be made by elevators for handling it. The Peavey company, which has 12,000,000 bushels terminal capacity at Duluth, West Superior and East Superior, will devote its East Superior houses to mixing and lower grades, its West Superior houses to coarse grains and its Duluth capacity to flax and wheat of the higher grades. It has a 4,000,000 bushel concrete storage at Duluth where the item of insurance is not a consideration.

In the work of improving its terminals at Duluth the Northern Pacific road has already spent several hundred thousand dollars and will probably use up a million before it is through. The whole west side of Rice's point has been widened 200 ft. by sand filling dredged from outside the dock line, and all tracks have been rearranged so that the road now has, or will have in a few weeks, more than 50 miles of yard and storage tracks. These yards are diagonals and are fitted with raised tracks for breaking up trains, by means of which device it is said the time occupied in breaking up trains will be cut in two and the men employed very much reduced in number. The road will build a line of docks and warehouses along the frontage as soon as present work is out of the way. Iron ore shipments for the past month have been very large from all head of the lake ports, as well as from Marquette and Ashland, but the Duluth, Mesabi & Northern docks in the upper bay at Duluth have passed the record for all ports but Two Harbors by moving about 925,000 tons in the month. The Two Harbors record was made last year and has not been reached since. It was 1,000,000 tons in 30 days. Shipments will be somewhat less in subsequent months this year, on account of the fact that most underground mines have now pretty nearly cleaned up their stock piles.

Capt. Alex. McDougall, who is now president of the Highland Canal & Power Co. of Duluth, is mentioned as president of the new Federal National Bank, which is to open in a short time with $500,000 capital. The canal and power company is commencing actual digging on its canal, which is designed to bring into Duluth 25,000 H. P. in 1904, and as much more as is required later. This first digging is on what is called "city line cut," a 50-ft. excavation that will break the divide between the waters that flow direct into Lake Superior at Duluth and those that reach the lake by way of the St. Louis river. This canal is expected to be one of the most important enterprises ever started at the head of the lakes, and should be most profitable for its projectors.

There is not a single ton of unsold anthracite coal on dock at the head of Lake Superior. This is bad enough but it is worse in its effect, for the usual summer shipments to interior points have not been made and the interior is not only bare of coal but had none left over and is absolutely out of the race in getting any if the strike should chance to be settled next week. The treeless northwest needs coal in its business, too. Indeed life will be impossible in many great stretches of the grain region this winter without it, and where it is to come from nobody knows.

LAKE FREIGHT MATTERS.

The iron ore interests are so fully determined upon shipping all the ore that can be handled by vessels and railways that a continuance of the present freights on ore is expected, even if the fall movement of grain should not require much of the vessel capacity. A shortage of coal in the northwest is now certain, and if there is a falling off in the ore trade the efforts of soft coal shippers to forward more coal would make up for the loss. It follows, therefore, that the vessel interests not only feel assured of the present freights holding out to the end of the season but look for substantial advances if the crops are up to estimates. On this score the following from a Duluth letter to Cleveland vessel brokers is of interest:

"In clement weather conditions continue to delay the receipts of grain. Our statistical crop year begins Aug. 1. From that date until Sept. 1, 600,000 bushels of grain of all kinds had been received here. During the corresponding period last year, 2,400,000 bushels had arrived. It is quite likely that wheat will come in liberally within the next ten days. We should be able to make some impression upon lake freights the second week in September. As to the magnitude of the crop, it is generally agreed the wheat yield is fairly large, that the flax is of 'bumper' proportions and that the production of barley, rye and oats is greater than ever before. Manitoba wheat crop is fully as large as last year and is now fully secure from frost."

AMERICAN SHIP BUILDING CO.

The annual meeting of the American Ship Building Co. will be held at No. 15 Exchange Place, Jersey City, N. J., on Wednesday, Oct. 1. No statement of earnings of the company for the last fiscal year, which ended June 30, has as yet been given out. It would seem, however, from the manner in which the company's stock, both common and preferred, has been advancing of late that the surplus earnings are sufficient to warrant dividends on both common and preferred stock for a long time to come. It is generally expected that at the annual meeting the common stock will be put upon a 4 per cent. dividend basis and that the statement of finances will be such as to expect permanency with this dividend, in addition to the 7 per cent. dividend that has been paid on the preferred since organization of the company. Rumors of retirement of the common stock, of purchase by an eastern ship building combination and of other reorganization schemes have all been officially denied, so that the advance in the stock seems to be entirely due to earnings and to the business which the company has booked ahead. A few months ago the preferred stock was selling at $95 to $97 a share and the common at $36 to $38. Now the former is selling at about $109 and the latter at about $62.

TUG STRIKE SETTLED.

The strike of tugmen of the great lakes, which had been in force practically since the opening of navigation, was settled in Cleveland Wednesday. Senator Hanna, President Keefe of the Longshoremen's Marine & Transport Workers' Association, Mr. Harvey D. Goulder and other representatives of lake shipping interests gave up a great deal of time to the settlement of the strike, and should have the thanks of the vessel owners, as well as the men and employers. The settlement is based briefly on an agreement providing for meetings in future between the employers and the tugmen, at which wages and other matters concerning both interests will be settled each year, as is the case with men employed on the docks and in other branches of the lake trade.

Most of the details are, of course, still to be worked out. Non-union men now in the employ of the towing company are not to be continued in the service but the union men who held to their contracts are to be retained.

GOVERNMENT DREDGE FOR LAKE ERIE HARBOR

The river and harbor bill, recently passed, authorized the secretary of war to build a government dredge for use in Lake Erie harbors. The bill did not, however, require him to build it and it is at present a matter of doubt whether it will be built or not. Maj. Dan C. Kingman, government engineer at Cleveland, forwarded to the war department on June 16 last all data upon which he had based his recommendations for a dredge, together with a description of the kind of dredge most suitable for the work. He asked for permission to employ experts to design the necessary structure. The department forwarded the data to Capt. Sanford of Charleston, S. C., who has designed a number of dredges for the government, notably for the Southwest pass, Texas, and for the Cumberland sound. Maj. Kingman wants a twin-screw, self-propelling suction dredge with hull capacity for 1,000 cu. yds. of material. Capt. Sanford called upon Maj. Kingman last week and discussed the subject of the dredge with him. He said that he could design the dredge and prepare the working drawings in fifteen days but added that he had received no advices from Washington upon the subject.

"There is opposition to the construction of the dredge from private contractors," said Maj. Kingman, "but I am satisfied the opposition is due to a misapprehension of the character of the dredge and the work for which it is intended. It is intended for government work which the ordinary dipper dredge cannot perform and which is so limited and uncertain in amount that it would not pay a private firm to build a dredge for the work. Now the work is this: Every spring bars form across the mouths of every one of the jettied harbors on Lake Erie. There is absolutely no way of preventing the formation of these bars. They will continue to be formed so long as there are winds and currents in the lakes, or in other words, forever. You may have observed that when the waves pound the beach the water is full of sand for hundreds and even thousands of feet out. If you have ever gone in bathing when a surf is rolling you were made disagreeably aware of it. I lately made a study of currents at varying depths by means of fishing poles with lead attached to their bases and with little flags fastened to their tops. There was so much of the with little flags fastened to their tops. There was so much of the pole beneath the surface of the water that the little that was above was not influenced by the winds. Whatever movement there was was actuated by currents solely. I found that they moved easterly at the rate of about a mile an hour, describing a slight outward curve at the breakwater. Now when the current carrying this sediment reaches the comparative stillness of the deep water at the end of the jetties it precipitates and gradually forms a bar. This is proved by the fact that bars form at every jettied harbor. Last year a serious bar formed off the mouth of Fairport harbor which was discovered at the opening of navigation. I was asked to remove it and contracted with a Buffalo dredge to do the work. Before the dredge could leave, however, the ice drifted into a compact mass for 25 miles around Buffalo, making it utterly impossible for the dredge to leave. After it reached Fairport it was a number of weeks before it completed its work. A suction dredge, operating under its own steam, could have done the work in two or three days. The dredge would load its hull to its full capacity of 1,000 cu. yds. and then steam to the dumping grounds. It could very quickly remove all the bars that form at Lake Erie harbors, a work which it is impossible for dipper dredges to do swiftly. It could be removed at 5 cents per cubic yard, counting cost of maintenance, repairs and office force, whereas I have had to pay 32 cents per cubic yard for this work. Now the government has to keep the channel open in the Maumee river and Maumee bay, a distance of 15 miles. This channel is no more than a trench in the middle of really shoal water. Such a trench always fills up to a depth of a foot or two. Skimming off the surface like this is mighty expensive work for a dipper dredge, because the bucket gets only about a third of a load, and we have to pay high for it. It is just the work, however, that a suction dredge can do. It would move along the channel at the rate of about 2 miles an hour and take off 3 or 4 in. in its passage. If the contractors understood the purpose of the dredge I don't think they would oppose it. But I don't know really whether it is going to be built or not."

LOCAL INSPECTORS AGAIN SUSTAINED.

Supervising Inspector John D. Sloane has again sustained the decision of the local inspectors at Duluth, Messrs. Monaghan and Chalk, in a case involving the suspension of a master's license for violation of rules. The decision of the supervising inspector is as follows:

"In the matter of the suspension by you of the license of Capt. Thomas Richardson as master and pilot for a period of sixty days, beginning Aug. 4, 1902, and ending Oct. 3, 1902, for violation of the rules of navigation governing the great lakes while in command of steamer Bloomer Girl, July 3, 1902, resulting in a collision between said steamer and steamer Newsboy, I wish to advise you that in accordance with his appeal from your decision, dated Aug. 5, 1902, after a careful consideration of the documents and evidence submitted with the appeal I find that the evidence sustains the action of the local inspectors and that the order of suspension made by you must be affirmed. Rule VI of the pilot rules for the great lakes provides that when two steamers are running in the same direction and the steamer astern desires to pass on the right or starboard hand of the steamer ahead it shall give one short blast of the whistle. It also provides that if the pilot of steamer ahead does not think it safe for the steamer astern to pass at that point, he shall immediately give several short and rapid blasts of the whistle, but that in no case shall the steamer ahead try to cross the bow, or crowd upon the course of the passing steamer. The rules also prescribe that due regard must be had to the dangers of navigation *and to any special circumstances in order to avoid immediate danger.* In other words, the rules last mentioned prescribe in effect that the master and pilot must exercise vigilance—use his eyes and ears—know the position of his own and surrounding vessels and use great care and caution when circumstances require it. According to the undisputed evidence in this case, Capt. Richardson, after sounding the danger signals in response to the signal of the Newsboy kept on his course, seemingly regardless of consequences. He had upon his left or port side a channel several hundred feet in width, with water of sufficient depth, clear of any passing vessels, according to the testimony, and had he steered in this direction, to the port side, the Bloomer Girl would not have collided with the Newsboy. No reason is given for his failure to do so, and it must therefore be held that he failed to exercise that regard to *special circumstances* in order to avoid danger which the rules prescribe. He kept blindly on his course, contenting himself with blowing the danger signal. Something has been said in reference to the action of the Newsboy prior to this time in racing the Bloomer Girl, etc. That matter is not in issue, nor under the circumstances could it justify a course of action which might jeopardize the lives of innocent passengers. Under the evidence your action, as before stated, must be and is sustained.

CANADIAN FAST LINE.

A few days ago Mr. G. H. Murray, premier of Nova Scotia and L. J. Tweedle, premier of New Brunswick, announced that the contract for the establishment of the Canadian fast line would be given to the Elder-Dempster-Allan combination but this statement is discounted in Ottawa. No definite statement of the government's attitude will be known until Sir Wilfred Laurier returns from England. Regarding the service Sir Thomas Shaughnessey, president of the Canadian Pacific railway, says:

"We will enter into no combination. We stand by ourselves. We have not, nor do we intend, to join forces with the Allan, Elder-Dempster and Furness lines for the fast mail service between Montreal and Liverpool. It is true that the Allans have submitted an independent tender for about an 18-knot service to Quebec in the summer and Halifax in the winter for a subsidy of £225,000, of which Canada pays £150,000, and Great Britain £75,000. Why therefore, should it be inferred or hinted that the Canadian Pacific seeks to join the alleged combination? If the Canadian Pacific does not get the contract it will establish a service of its own. Our engineers are engaged in perfecting plans for the straightening out of the Canadian Pacific roadbed and the reduction of its gradients, and it is proposed to reduce the time across the continent to seventy hours."

In connection with the proposed scheme for a fast steamship service between Canada and the old country it should not be forgotten that in 1894 Mr. Huddart came to Ottawa, by invitation of the Dominion government, and proposed a weekly service of steamers, maintaining a 20-knot speed in normal conditions, acting as large passenger carriers and fitted at the same time with refrigerating machinery for the conveyance of first-class perishable goods. The Canadian parliament having sanctioned a subsidy goods. The enterprise was considered but abandoned.

WET ORE.

The ship master who is unfortunate enough to tie up to a Lake Erie dock with wet ore (however little of it) in the hold of his vessel is liable to have little regard thereafter for the ore shovelers, but his troubles seem mild in comparison with difficulties on the same score encountered in the Cumberland (England) district. In a very recent case the consignee secured the cargo, owing to moisture, at a reduction of fully 30 per cent, while the discharging cost 3s. 10d. per ton, or an equivalent of 82 cents. One of the rules of the Ore Laborers' Union is that for any work done from noon on Saturday till 6 o'clock on Monday morning the wages of each man shall be 4s. ($1) per hour, which rule is most rigidly enforced. This experience has caused Fairplay of London to burst into song to ship owners as follows:

If e'er your ships with Spanish ore
Get stranded on the Cumbrian shore,
Submit with philosophic grace
To worried be in every case.

Sea-watered ore may just as well
Be sent to where bad angels dwell;
'Tween consignee and stevedore,
Its value swallowed up and more.

Some other parties follow suit.
The ship in turn becomes their loot.
Theirs is the ancient simple plan,
To take what comes and keep who can.

AROUND THE GREAT LAKES.

Capt. W. R. Williams, a veteran navigator of the lakes, died at Milwaukee a few days ago.

A special meeting of the Lumber Carriers' Association will be held in Chicago Sept. 18 to fix fall carrying charges.

The use of the tug Myra in St. Mary's river has been condemned by Vessel Inspectors Gooding and York, so that next season the government will have a large steel tug, modern in every respect, in the river.

Capt. Samuel Neff of Milwaukee has sold the barge O. J. Hale to the Howard Transportation Co. of Chicago, who will use her for transferring grain. The Hale is 138 ft. long and will be one of the biggest transfer boats in Chicago river.

Capt. Herbert Winslow has been assigned to Detroit as assistant to Com'dr E. H. Gheen, lighthouse inspector for the eleventh district. It is understood that Com'dr Gheen is to transferred to another post as soon as Capt. Winslow familiarizes himself with the work.

The south branch of the Chicago river, lying between Canal and Twenty-second streets, is to be widened. Owing to the swift current and the sharp bend below Canal street, big vessels have always had trouble there. The improvement work is to be done under the direction of the sanitary board.

In seventy-two trips this year between Milwaukee and Chicago the whaleback excursion steamer Christopher Columbus has carried approximately 185,000 passengers. The season has been short, as it did not begin until June 28, and yet the number of passengers is only about 15,000 less than in 1900, when the Grand Army encampment at Chicago furnished a considerable increase in traffic.

Gen. Mgr. Parker of the White Star line (Detroit and St. Clair river excursion boats) says that his company is preparing to place an order for an excursion steamer that will have capacity for about 1,500 passengers, in addition to a large amount of freight. The company does not intend to try to secure the vessel for next season, on account of the crowded condition of the ship yards. Their plans are for 1904.

The new wrecking lighter Thomas F. Newman, the latest acquisition of the Great Lakes Towing Co., and which was built by the Jenks Ship Building Co. of Port Huron, was given her first practical trial a few days ago and worked to the complete satisfaction of President Newman of the tug company and Capt. Watson, who will be in command of the boat.

Capt. Daniel F. Miller, one of the best known lake men, died at Grand Haven last week. Capt. Miller was fifty-nine years old and had followed the lakes for forty-five years. In November, 1883, while mate of the schooner Driver, he assisted in saving the lives of the crew of the schooner H. G. Ackley which foundered in the middle of Lake Michigan. For this bravery he was awarded a gold medal by congress.

Mr. George W. Bissell of Detroit, who was at one time quite prominent in marine affairs, died this week as the result of an accident. He was out driving with a spirited team of horses which, becoming frightened at an automobile, ran away and threw him out. Mr. Bissell was among the first to build the large steel boats now used in the ore trade. He was one of the organizers of the well known timber firm of Alger, Smith & Co.

A Milwaukee dispatch says that the Milwaukee Western Fuel Co., which was organized in that city some months ago with a capital of $2,000,000, has passed into the hands of the Pittsburg Coal Co. The Milwaukee company was composed of the Uhrig Fuel Co., the H. M .Benjamin Fuel Co., the R. P. Elmore Coal Co. and the George B. Eastman Co. The Pittsburg Coal Co. now controls all the coal docks at Milwaukee.

Engineers making a government survey have located near Manitowoc the shoal that has been a source of trouble to steamers for some time past and on which the steamer Tuscarora was damaged recently. The shoal is 1½ miles south of the harbor and about ¾ mile in the lake, and extends for 1,600 ft. Soundings have been taken and in some places the depth of water is not over 13 ft. Report will be made to the department and buoys placed immediately.

It is reported from Duluth that Pickands, Mather & Co. of Cleveland, have taken an option to buy the lease controlled by the Elizabeth Iron Co. in section 12, near Penobscot mine at Hibbing on Mesabi range, for $350,000. The property is said to have been proved to contain 12,000,000 tons of iron ore. Three drill holes are in 330 ft. of ore. It is a state lease and the royalty is 25 cents. Pickands, Mather & Co. control the Albany, Crete, Corsica and Elba mines on Mesabi. Duluth parties compose the Elizabeth Iron Co.

The steamer Hattie B. Pereue sunk at the entrance to Ludington harbor with her deck load of lumber on Monday night. She was en route from Empire, Mich., to Benton Harbor with 275,000 ft. of lumber. While off Big Point Au Sable it was discovered that she was leaking fast and she was accordingly headed for Ludington. Capt. John Kemming kept the pumps working and the whistles blowing distress signals until the fires were extinguished. A tug ran out to her assistance but she sank before she could quite get into port. The Pereue is 122 ft. long, 29 ft. beam and has a gross tonnage of 193. Her owner is C. G. Marsh of Chicago.

The Detroit & Cleveland Navigation Co. a few days ago sent checks to the amount of $200 to the crew of the steamer Joliet of the Pittsburg Steamship Co.'s fleet as a token of its appreciation of the services rendered the disabled steamer City of Cleveland when she broke her main shaft off Lorain, in Lake Erie over a month ago. The big freighter ran past the City of Cleveland and upon discovering her condition gave her a line and towed her back to Detroit, where repairs were made. The checks were as follows: Capt. A. W. Burrows, $100; First Mate Henry McEwen, $25; Second Mate E. F. Bernard, $10; Engineer George Lynn, $50; and Second Engineer Joseph Walker, $15. The checks were signed by General Manager W. C. McMillan.

Vessel men have advanced the wages of firemen, oilers and water tenders to $52.50 per month for the balance of the season in accordance with a contract made early in the year that the wages should be advanced to that figure. The wages of cooks on schooners and consorts have also been advanced to the same amount. The first cooks on steamers have received no advance but the pay of their helpers has been increased to $1 per day. The members of the Seamen's Union (wheelsmen and watchmen) have asked for an advance from $45 to $52.50, and a committee of vesselmen has been appointed to consider it. A call has been sent out for a meeting of the representatives of the Seamen's Union with the vesselmen on Sept. 10, at which time an endeavor will be made to settle the wage question for the balance of the year. It is likely that the $52.50 will be granted.

The wrecking tug Reliable started down the Detroit river recently on a junk expedition and returned with the oddest collection of stuff that a vessel ever picked up from the bottom of the water. The Detroit Tribune says: "One of the articles picked up on this trip was a twenty-one conductor armored copper submarine cable, fully a mile in length. The end of the cable was found abreast of Fighting island, and it stretched along the Ecorse ranges to Grassy island. The most peculiar feature of the find was the position of the cable. It was stretched down the river lengthwise, and the crew of the tug at first thought it was a steel tow line. The cable was undoubtedly lost by the Michigan Telephone Co., but how it was carried down the river for a distance of 7 or 8 miles will ever remain a mystery. A passing vessel may have picked it up in some manner and towed it that far, or it may have been torn away by ice and carried down with the drifting mass. At any rate, it was a valuable find for the tug, as the cable is said to be worth between $2,000 and $3,000. Another good find was an immense anchor chain of about 90 fathoms, and weighing about 7 tons. The chain was picked up near Fighting island. A large anvil in perfect shape was fished out near the Michigan Central dock, and then there were heavy iron wrenches, copper piping, grating and other things too numerous to mention. Al Tebo, the diver, does all the finding. He dons his heavy submarine suit and when the tug comes to an anchor, he clambers over the side and scours the bottom of the river. The articles are then hoisted on the boat."

SHIP YARD NOTES.

The Monongahela River Consolidated Coal & Coke Co. of Pittsburg has shipped to St. Louis the general equipment for its big new steel towboat Peter Sprague. She is by far the largest and most powerful of all river towboats. She is built entirely of steel from keel to cabin and is of the following dimensions: 315 ft. over all; 275 ft. keel; 64 ft. wide. There is not a nail used in her construction, screws alone finding a place. Her shaft is 37 ft. long and 31 in. in diameter and is said to be the largest ever cast by the Bethlehem Steel Co. It differs in construction from the ordinary shaft in that it is hollow its entire length. The Sprague is equipped with six Hopkins boilers. The most astonishing thing about her is the size of her wheel. It is 64 ft. in diameter and 64 ft. in width. The crank shafts used in turning this wheel are simply enormous. She will be lighted throughout by electricity and will have her own ice plant. Her first trip will be to New Orleans.

Washburn Bros. Thomaston, Me., launched the four-masted wooden schooner Harry T. Hayward last week. She is 180 ft. long, 40 ft. beam and 19 ft. deep. She has four tier of keelson, each 15 by 15 in., and two sister keelsons, each 14 by 14 in. The ceiling is of yellow pine, 10 by 14 in., and planking of the same material, 4½ in. Her frame is of the best Virginia oak, securely fastened with 1⅛ in, iron. She has two full decks with poop taking in the mainmast. The four masts are of Oregon pine, each 99 ft. long, and topmasts 52 ft. long. Washburn Bros. have in their yard the frame of a five-master, the largest schooner ever built so far in Thomaston. Her dimensions are: Length of keel, 265 ft.; beam, 48 ft.; depth, 22½ ft.; capacity, 4,000 tons.

Joseph Paquet, Portland, Ore., is building a passenger steamer of the following dimensions: Length, 159 ft.; beam, 22 ft.; depth, 9½ ft. She will be fitted to carry about 325 passengers and will cost approximately $40,000.

The passenger steamer Memphis, owned by the Southern Railway, has been practically rebuilt at the yards of W. E. Woodall & Co., Baltimore, Md., at a cost of $35,000.

The Johnson Iron Works, New Orleans, La., are making extensive repairs on the fruit steamer Santo Oteri for the United Fruit Co. at that port.

The Ottamen cruiser Medijidia, building at Cramps, is reported about 45 per cent. completed.

HUDSON RIVER DAY LINE.

"People who travel between New York and the north or west, either on business or pleasure bent, and have not availed themselves of a trip up or down the Hudson river on one of the Hudson River Day Line boats, which ply between New York and Albany every week-day during the season, have missed the trip of their lives," remarked a much traveled New York friend to the writer, and continued: "And those, who weary of the dull routine of daily life, desire an outing of a day or two where they can find perfect rest, garnished with exquisite pleasure, should seek this trip, and I will warrant that the trip once taken will be repeated as often as opportunity presents itself."

"There is nothing in the wide world that I have ever experienced to compare with this noble stream and its scenery. Some German, familiar with the far-famed Rhine of his native country, has compared the Hudson with that river, which not only emphasizes the German's innate love and admiration for his fatherland and all that pertains to it, but is arrant flattery of the German stream as well; which fact must be acknowledged by those who have traversed both rivers. Not only is the water of the Hudson, with its clear depth of blue, more pleasing to the sight, but its scenery, in its variations from pastoral beauty to sublime grandeur, is far and away ahead of that of its foreign rival. In fact, in this respect, the Hudson stands alone, and cannot in justice be compared to any other navigable river on earth. Its scenery is to nature what the Bible and Shakespeare are to literature, as the more it is studied the more new surprises of beauty and grandeur one discovers; but with the difference that it is transcendent in the same degree that the handiwork of the Creator transcends that of man. Not only is the river with its scenery enchanting, in the superlative degree, from its rise in the Adirondacks to its majestic sweep past the palisades into New York bay, but its entire length is rich in legendary and historical lore, every point along its entire course bringing up memories of Indian legends and the grand struggle for American independence so nobly and successfully sustained by the heroic patriots of Revolutionary fame."

"But," continued my friend, "it must be seen to be appreciated. Even Irving and Cooper have failed to do the subject justice, and one has but to view the scenes of which they have so eloquently written, and of which poets have sung, in order to realize how feebly mere words can be made to describe the beautiful and sublime work of the Creator of the universe, as here exemplified." Then addressing me direct said: "If you have not taken this trip you should lose no time in doing so, as, to anyone in the least imbued with the love of beauties of nature this trip is worth the time and expense of crossing the continent to enjoy."

Being so imbued I sought the headquarters of the line at the foot of Desbrosses street, New York, for further information. Here I learned that the line consisted of two steamers, the New York and Albany, built expressly for this service; that the officers of the company are E. E. Olcott, president and general manager; F. B. Hibbard, general passenger agent; T. C. Van Santwood secretary; with W. B. Elmdorf, general agent at Albany. The steamer New York is commanded by Capt. A. H. Harcourt, with E. Magee, mate, H. C. Magee, chief engineer, P. Magee and J. R. Magee, pilots. The Albany is commanded by Capt. Geo. A. White, with Mate Chas. Griffen, Chief Engineer S. E. Midlam, and pilots D. H. Deming and Statts Winne. The boats leave New York at 8:40 and Albany at 8:30 every morning (Sundays excepted) from May 28 to Oct. 28, each season, arriving at their respective destinations at 6 p. m. the same day. The fare one way, 150 miles, is but $2.00 and for the round trip of 300 miles, $3.50. That the boats carry only passengers and their baggage. There is a check-room on the main deck where wraps, parcels and hand baggage may be checked free of charge; a dining room on the main deck aft, where meals are served all day from 7 a. m., a *la carte* or *table d'hote*, the price of the latter being breakfast 75 cents and dinner $1; and last but not least in these days, passengers were requested not to fee, that is " tip" any employe of the boats.

I also learned that through tickets can be secured at the company's offices in New York for any point north or west, with free transfer of baggage at Albany to desired railway; also that tickets are on sale at the offices of the principal railways of the north and west via this route good to any of the stopping points of the boats, to let off and take on passengers, between New York and Albany, which are Yonkers, West Point, Newburgh, Poughkeepsie, Kingston Point, Catskill and Hudson.

Desiring to take a trip westward, and remembering the admonition of my friend, I secured a ticket and boarded the New York on a late August morning. The New York and Albany are sister side-wheel vessels. They were built by the Harlan & Hollingsworth Co. of Wilmington, Del., the engines being furnished by the W. & A. Fletcher Co. of New York and Hoboken, which is sufficient proof to any one acquainted with these well-known firms that both boats and their motive power are the best that mechanical skill can produce. In proof of this it is only necessary to state that the Albany, whose engine is of 3,200 H. P. with 73-in. cylinder and 12-ft. stroke, on her trial trip made 75 miles in 3 hours and 7 minutes; while the New York with 3,850 H. P. engine, 75-in. cylinder and 12-ft. stroke, is said to be the fastest side-wheel steamer afloat. These steamers are provided with all the latest and most approved machinery and auxiliaries, including steam steering gear and feathering paddle-wheels, the latter not only aiding in increasing the speed of the vessel but also doing away with the vibration, or tremor, so uncomfortably noticeable on boats having the ordinary wheel.

It would require too much time and space to enter into a detailed description of the boats and the service one finds aboard, suffice it to say that the accommodations, furnishings and uniform politeness and attention of captain and crew, down to the least of the baggage handlers, is a revelation to persons who have been accustomed to patronizing the ordinary river craft, while evidences of cleanliness and an air of refinement pervades everything. A wise provision of the company, to obviate overcrowding, is while the capacity of each boat is 4,500 passengers, license is taken out for but 2,500.

As to the scenery along the route, as my friend asserted. "It must be seen to be appreciated." Masters of descriptive writing have tried to describe it and yet one wonders upon viewing the scenes they have tried to describe why they have fallen so far short in their efforts. The only answer must be that these scenes are beyond the power of pen to describe. Therefore, the only way to form a proper conception of their beauty and grandeur is for one to view them for one's self. G. W. R.

SHIP BUILDING MATERIAL IN GERMANY.

The privilege accorded the ship building materials imported into Germany, in the way of exemption from customs duty, was not utilized last year to such an extent as was done in 1900, which is probably due to the fact that Germany is making her own materials. The official trade statistics of the empire show that the imports of materials of which ships are built were smaller, both as regards quantity and value, than they were in the previous year, and that the value of these imports was even a trifle below that of 1899. The figures are:

1899..494,606 double-centners, valued at 10,800,000 marks.
1900..569,699 double-centners, valued at 14,700,000 marks.
1901..538,254 double-centners, valued at 10,300,000 marks.

The importation was, therefore, less by 31,445 double-centners as regards the weight and 4,000,000 marks as regards the value. The lower value is accounted for to a great extent by the cheaper prices of iron and timber. Since 1899 the sources from which these materials were derived have been stated in the statistics, so that it is now possible to make comparisons respecting the quantity and value of ship building materials sent to Germany from the different exporting countries. The articles most in demand appear to have been rough plates of malleable iron, angle-iron, pig iron, malleable iron in bars, anchors, chains, coarse iron ware, timber, steam engines, lifting machines, steam pumps, and other machinery, fishing nets, etc. The machinery consisted for the most part of steam engines and lifting machines, principally imported from England. In 1901 steam engines were imported to the value of 413,000 marks, against 1,100,000 marks in 1900; the value of lifting machines imported was 440,000 marks, against 353,000 marks in 1900, and the pumps imported were worth 166,000 marks, against 351,000 marks. In spite, therefore, of the greater development of the German ship building industry, the importation of materials is lessening, and the dependence on supplies from abroad is lessening with it. The duty-free importation of rough plates of malleable iron has also decreased. In 1899 it amounted to 4,000,000 marks in value and 209,579 double-centners in weight, while last year the value was only 2,800,000 marks, and the weight 178,665 double-centners. Smaller quantities of angle-iron were also obtained from abroad, but the falling off was much greater as regards pig iron, anchors and chains, and the timber imported for ship building (mostly from the United States) was likewise less in quantity and value last year.

THE ATLANTIC EXPRESS SERVICE.

Apropos of the fact that the English seem to have abandoned the field of the really fast express service in the Atlantic trade the Liverpool Journal of Commerce soberly remarks:

"The recent launch of the Kaiser Wilhelm II. has been the occasion for a certain amount of moralizing. Indeed, it is even asserted that we are yielding our pride of place on the Atlantic to our Teuton friends. We certainly have not now running in the Atlantic trade the fastest vessels but that fact does not necessarily carry with it the assumption that the British shipowner is less enterprising than the pushful foreigner. The shipowner is as keen today as ever; nor is the marine architect less master of his business than of old. While it is not possible to look upon the position which this country presently occupies in the Atlantic trade without just a little feeling of regret, yet this scarcely justifies the mournful view taken by some writers, for we have sufficient faith in our shipowners to believe that whenever it is possible to make the fastest ships afloat add to the dividend-earning capacity of the line owning her, such a vessel will be found running under the British flag. The shipowners in the Atlantic trade are not less capable of conducting their business with enterprise and ability than their brethren who may be engaged in other trades, and if they have not seen fit to embark upon the same costly enterprises as is the case elsewhere, it may be taken for granted that such action does not arise from a want of those factors which have brought into prominence our German friends.

SUBMARINE AND LAND TELEGRAPHS.

"The Submarine and Land Telegraphs of the World," is the title of a monograph prepared by the treasury bureau of statistics which will appear in the forthcoming monthly summary of commerce and finance. It presents some information regarding the submarine telegraphs of the world which is especially interesting at this time in view of the prospective construction of an all-American cable across the Pacific. It shows that the submarine telegraphs of the world number 1,700. Their aggregate length is nearly 200,000 miles; their total cost is estimated at $275,000,000, and the number of messages annually transmitted over them is more than 6,000,000. All the grand divisions of the earth are now connected by their wires, and from country to country and island to island the thoughts and words of mankind are instantaneously transmitted. Beneath all oceans save the Pacific the universal language which this system has created flows uninterruptedly, and man talks as face to face with his fellow-man at the antipodes. Darkest Africa now converses daily with enlightened Europe or America, and the great events of the morning are known in the evening throughout the inhabited world. Adding to the submarine lines the land telegraph systems by which they are connected and through which they bring interior points of the various continents into instantaneous communication, the total length of telegraph lines of the world is 1,180,000 miles, the length of their single wires or conductors, 3,800,000 miles, and the total number of messages annually sent over them about 400,000,000, or an average of more than 1,000,000 each day.

In the short half century since the practicability of submarine telegraphy was demonstrated, the electric wires have invaded every ocean except the Pacific. Nearly a score of wires have been laid across the Atlantic, of which no less than thirteen now successfully operate between the United States and Europe, while three others span the comparatively short distance between South America and the African and South European coast lines. Throughout the Indian ocean lines connect the far east with Europe and America via the Red sea, the Mediterranean, the western coast of Europe, and the great trans-Atlantic lines. The Mediterranean is crossed and recrossed in its entire length and breadth by numerous cable lines, and the "Mediterranean of America," the Gulf of Mexico and the Caribbean sea, is traversed in all directions by lines which bring its islands and colonies into speaking relations with each other and with South America, Central America, the United States, and thence with Europe, Africa, Asia—the whole world. Along the eastern coast of Asia, cable lines loop from port to port, and island to island, receiving messages overland from eastern Europe via the Russian-Siberian land lines and forwarding them to Japan, China, Australia, New Zealand, the Straits settlements, Hong Kong and the Philippines, and receiving others in return. South America is skirted with cable lines along its entire border save the extreme south, where they are brought in to intercommunication by land lines. Along the entire coast of Africa, cables loop from place to place and from colony to colony, stretching along the entire circumference and penetrating the interior by land lines at various points.

Ever body of water lying between the inhabited portions of the earth, with the single exception of the Pacific ocean, has been crossed and recrossed by submarine telegraph lines. Even that vast expanse of water has been invaded along its margin, submarine wires stretching along its western border from Siberia to Australia, while its eastern borders are skirted with lines which stretch along the western coast of the two Americas. Several adventurous pioneers in Pacific telegraphy have ventured to considerable distances and depths in that great ocean, one cable line running from Australia to New Zealand, a distance of over 1,000 miles, and another extending from Australia to the French colony of New Caledonia, 800 miles seaward. A cable which is to connect Canada with Australia across the Pacific is now being laid at the joint expense of the United Kingdom, Canada and the Australian commonwealth and has already been completed from Vancouver, British Columbia to Fanning island, just south of the Hawaiian islands, and it is expected that the entire line will be completed by the end of the present year.

The chief obstacle in the past to the construction of a grand transPacific cable was found in the fact that mid-ocean resting places could not be satisfactorily obtained or arranged for, no single government controlling a sufficient number of suitable landing places to make this seem practicable, in view of the belief that the distance through which messages could be sent and cables controlled was limited. With landing places at Hawaii, Wake Island, Guam, and the Philippines, however, no section of a cable stretching from the United States to Asia and touching at these points would have a length equal to that now in daily operation between France and the United States. The length of the French cable from Brest, France, to Cape Cod, Mass., is 3,250 miles, while the greatest distance from land to land on the proposed Pacific route would be that from San Francisco to Hawaii, 2,089 miles; that from Hawaii to Wake island being 2,040 miles, from Wake island to Guam, 1,290 miles, from Guam to Manila, 1,520 miles, and from Manila to the Asiatic coast 630 miles. While the depth of the Pacific is somewhat greater than that at which any cable has been laid, the difference between its depth and the greatest depth reached by cables in the Atlantic would be very slight, the cable recently laid from Haiti to the Windward islands being in 18,000 ft. of water. The recent survey for a cable between the Pacific coast and Manila justifies the belief that a route can be selected in which the depth will not exceed 20,000 ft. and may not exceed 18,000 ft. The recent survey made by the bureau of equipment, navy department, under the direction of Rear Admiral R. B. Bradford, disclosed the greatest ocean depths heretofore known lying between Midway island and Guam and being 31,614 ft., or about 66 ft. short of 6 miles depth of water. This depression, however, which has been named the "Nero deep," in honor of the vessel from which the sounding was made, can be avoided by a detour, and it is believed that the necessary depth will not exceed 20,000 ft. and may not be more than 13,000 ft.

SHIP BUILDING ON THE DELAWARE.

Philadelphia, Sept. 3.—The American Dredging Co. of this city has secured the contract for dredging the 30-ft. channel in the Delaware from Philadelphia to the sea. Their bid was $1,599,100, and calls for the excavation approximately of 10,599,100 cu. yds. of material. The work is to be done under provision of the river and harbor act of June 13, 1902.

The Pusey & Jones Co., Wilmington, Del., has secured a contract for the construction of two tugs for the quarter-master's department of the United States government. Both vessels are to be of steel and each of a length of 116 ft.

At the Delaware River Ship & Engine Building Co.'s yards, Chester, Pa., the steamer Paraguay is being fitted with two new propeller blades to replace those lost on her last voyage. The Paraguay is engaged in the bulk oil trade between Texas and Philadelphia.

The new tug Astral, recently launched at Dialogue's ship yard, Camden, N. J., is receiving her engines and boilers and will in a month be ready for delivery to her owners, the Standard Oil Co. The Astral is first of a number of tugs now being built for the Standard Oil Co.

The steamship Arapahoe, newest vessel of the Clyde Line fleet, arrived here last week to follow the Apache of the same line on the dry dock at Cramp's ship yard. The Arapahoe will be cut in half and lengthened 60 ft., a similar operation to that performed on the Apache, which was lengthened 52 ft.

The United States cruiser Denver is being prepared at the Neafie & Levy ship yard for her trial trip. She is in dry dock and being sheathed with wood. Over that will be placed copper up to the water line to prevent her bottom getting fouled with barnacles, etc., when she is accepted and sent to the Philippines for service.

Finishing touches are being placed on the steamer Texan, which was launched on the 16th, ult., by the New York Ship Building Co. When completed she will go to New York for cargo for her maiden voyage to San Francisco. At that place her oil-burning apparatus will be installed and she will enter the American-Hawaiian Steamship Co.'s regular fleet trading to the Hawaiian islands.

The Bainbridge, second of the trio of sister torpedo boat destroyers, built for the government by Neafie & Levy, left her builders' yards a few days ago, on the way to Pearson's, Md., where she will be put in order for her official trial over the government course off Barren island, Chesapeake bay. Her builders predict that the Bainbridge will equal her sister ship Chauncey's magnificent figures of 29.51 knots an hour.

The big freight steamship Californian, which discharged her cargo of sugar at Washington avenue wharf last week, had for this purpose an arrangement which was an innovation in local shipping circles. On deck fore-and-aft were two spider-like derricks having eight arms each. Four of the arms hauled the cargo from hold to deck while the other four transferred it to the wharf. Each series of arms was attached by block and tackle to one central spar about the size of a jury-mast. The unloading was accomplished with remarkable rapidity.

The torpedo boat destroyer Barry, a sister of the Chauncy and the Bainbridge, returned to the Neafie & Levy ship yard on Friday after a successful official trial trip run over the Barren island course in Chesapeake Bay. In her standardization test the destroyer made a maximum speed of 28.6 knots and on endurance trial maintained for four hours an average speed of 27 knots, at times running as fast as 28 knots. The contract called for only 26 knots. Two weeks ago the Chauncy over the same course went a mile in the standardization run at the rate of 29.51.

The United States, dealer in islands and unconsidered trifles of this nature, is in trouble about Marcus island, lying 1,000 miles southwest of Yokohama and about 500 miles northeast of the Ladrones. About thirteen years ago Capt. Rosehill landed on this lonely island, hoisted the American flag, deposited a written claim to the find in a bottle and sailed away, leaving the island unoccupied. He notified the United States authorities but failed to file the necessary bond. Meanwhile the Japanese landed on the island and left forty men to guard it. In other words they are now in possession. An American expedition from Honolulu has just set sail to the island to dispute the issue with Japan. A Japanese warship has sailed from Yokohama to defend the title of its country. Meanwhile the outcome is in doubt. The United States, being in the island business, will probably make the necessary representation to support its title to this oriental possession.

TESTS OF FIREPROOF WOOD.

Mr. Edward Atkinson of Boston, director of the Insurance Engineering Experiment Station and president of the Boston Manufacturers' Mutual Fire Insurance Co., sent to six wood-fireproofing companies a request that they should supply, for instance, fireproofed library shelves. Two New York companies and one Philadelphia responded and the result of the tests is set forth in a long report by Mr. Atkinson, from which the following extracts have been taken:

"A doubt having been expressed by one of the principal promoters of the use of so-called fireproof wood, in regard to what he called our 'theoretic methods' of dealing with the subject, he also stating that it was too late to question the 'absolutely incombustible' quality of this product, as he had certificates to that effect from men of the highest scientific authority, I thought it best to make a practical test on my own behalf. I therefore sent to my country house, where I have a large open fireplace, nearly half a bushel of blocks, split wood, and shavings of all the types of fireproof wood yet submitted for testing, including black walnut, poplar, pine and cherry wood. I first put upon the open grate a quantity of newspapers bunched up, in the hope of getting sufficient circulation to make a newspaper burn. Upon this foundation we placed the fireproof material in the form of a cone, the preparation beginning at 8 p. m. We lighted the newspaper with a match, but found that the weight of the wood had crushed it together so that we could not get any good flame from the paper, the wood not being ignited. We then shoved more newspapers under the grate and used the bellows to keep the paper on fire, in which we succeeded, although it took some time. At 8:30 the fireproof wood was well ignited, showing a small flame of greenish-orange tint from the distillation of the chemicals. At 8:45 the flames, first greenish and orange and then yellow, were from 12 to 18 in. high, with a bed of hot coals underlying the flame. At nine o'clock the flame had diminished. The mass constituted a very hot, glowing bed, burning more like coal than wood, with a little flame of the greenish tint upon the top, derived from small pieces which had fallen off at the beginning, and had been placed upon the bed of coals. At 9 o'clock the mass was a bed of glowing material bearing no appearance to wood in the body of the fuel—much more like a hot coal fire. This form of combustion lasted until 9:30 p. m., when there was a small bed left about the size of the top of a hat. After that no further notes were taken. In the morning there was perhaps a pint or a little more of charcoal left upon the grate.

"The theory of absolute freedom from combustion does not appear to be sustained by this practical test. My own conclusion, from my observation of Prof. Norton's work and the foregoing tests, is that the term 'fireproof,' applied to chemically treated wood, is a misnomer, tending to mislead persons not well-informed upon the subject. The claim that any such wood is 'absolutely incombustible' is without any warrant in fact. The chemical treatment works in some measure as a fire-retardent. The wood is less flammable from any direct contact with small quantities of burning material. Even if the heat from the burning of other substances partially ignites it, the fire goes out when the outside cause is withdrawn. On the other hand, if the so-called fireproof wooden finish of a building otherwise incombustible is exposed to a high temperature from the combustion of the contents of any room in the building, the chemicals will be speedily distilled; the so-called fireproof wood then becomes ignited and will continue to burn or the fire will go out substantially according to the kind of wood that has been treated. If any wood of any kind, treated or untreated, is used for the interior finish of a building otherwise of incombustible material, in the judgment of the undersigned, such wood should be encased in thin metal.

"In the body of this report I have suggested that if any wood is used for the interior finish of a steel frame or concrete building, it should be encased in metal. I withdraw that suggestion in respect to the chemically treated wood, lest fungus or mold should be increased by the exclusion of the air. If wood in its natural condition is encased in metal it should be thoroughly seasoned so that no ferment or dry rot, so-called, may occur. For a finish upon a wall the metal should be carried over the face, around the edges and ends, and part way over the back of the finish.

"The theory of the fire door made of wood encased in tin, which has long served as a fire resistant in factory practice, is that while the wood may be slowly carbonized by the heat which passes through the metal, yet the exclusion of the oxygen prevents ignition and renders the door a heat retardent so long as even the charcoal maintains its position; charcoal itself being a heat retardent until ignited.

"One architect in the city of New York has objected to the protection of wooden finish with a covering of thin metal on the ground that, in case of a hot fire in the contents of such building, the metal would melt. The thin metal customarily used is a sheet of steel coated with tin, commonly called tin plate. Any heat that would melt steel would consume unprotected wood in a few seconds, whether treated or untreated, and would wreck any steel-framed building protected by any covering yet devised. Another architect objects to the wooden door encased in tin, on the ground that it will warp and curl, showing a strange lack of information in regard to common practice in factory construction and protection. The wooden door encased in tin has been adopted in order to overcome the danger of iron fire-doors, which almost invariably warp and curl. The wooden door encased in tin has invariably served its purpose in holding fire from passing from one room or one building to another until the fire department could get the control of the fire."

POINT IN FAVOR OF TWIN-SCREW SHIPS.

Not all of what Rear-Admiral George W. Melville, engineer-in-chief of the navy, had to say in favor of twin-screw ships was contained in his article on that subject in the last issue of the Review. The conclusion of the article is as follows:

"It is surprising that a single-screw steamer is still a paying investment. Hundreds of thousands of persons travel every year on the ocean, and it would seem as if every one of these passengers should be an active personal force in discouraging travel by such conveyance. Hundreds of instances could be cited where single-screw ships have had the misfortune to break their shafts, lose their propellers or suffer other casualties which have rendered them helpless, but which would have only delayed the twin-screw steamer. The experience of the Umbria, a sister ship to the Etruria, may be recalled. This vessel left Liverpool for New York in December, 1892, with 380 passengers on board. She encountered continuous bad weather for nearly a week, and when near the Newfoundland coast her propeller shaft broke. She was picked up by a passing steamer, which attempted to tow her. The sea was too heavy for this undertaking, however, and the attempt had to be abandoned. From the time of the accident to the vessel, her chief engineer realized that the Umbria could only be saved by making a temporary repair which would enable the ship to be moved by her own propelling engines. Through skill, almost bordering on genius, and by executive leadership of rare ability, the propeller shaft was repaired so efficiently that the vessel was able to resume her voyage, and, to the delight of millions of people in England and America, the ship reached New York under her own steam. The work of Chief Engineer Tomlinson of the Umbria was deserving of royal recognition. All sailors can tell tragic and yet inspiring tales of the sinking of single screw steamers, whose loss might have been averted if the ship had been fitted with twin-screw engines. About seven years ago the German gunboat Iltis was lost in a typhoon off the China coast. The ship was bravely weathering the hurricane until she lost her propeller. Although crew and officers realized that the end was near, there was no fear in their hearts. Huddling together on deck, they raised aloft the flag of Germany to the topmast, and then they tried to drown the mad requiem of the tempest by cheering for kaiser, for home and for country. Even as the wild waves were overpowering the brave sailors of the fatherland, the last remnant of the heroic band were seen clasping hands, and were heard singing, even in the jaws of death, that greatest of battle hymns—Luther's "Ein Feste Burg."

"There would be less going to sea upon the part of commercial travelers, tourists, and the general public if they only kney of the physical condition of officers and men upon particular occasions. When men are under physical and mental strain for a protracted period it should not excite surprise that at times it requires the exercise of high moral courage and strong will power to continue on duty. Only a few years ago, from sheer exhaustion, one of the pilots of a ferry boat plying between Brooklyn and New York fell asleep at his post, after having been continuously at the wheel for over eighteen hours. As a result, there was a collision with another ferry boat and hundreds of lives were placed in peril. This sleeping on post upon the part of sea-going men, due to overwork, is a much more common occurrence than is realized.

"There should also be a stringent national statute compelling ship owners to provide an adequate and efficient complement of men and officers, both on deck and in the engine rooms of every sea-going passenger ship, for safely operating the vessel. No officer or member of the crew should be permitted to stand watch over eight hours a day on board any sea-going vessel. In addition to his regular watch duty, practically every man on board ship will be called upon for extra duty, for, when getting under way, coming to anchor, in times of rough weather, and when casualties occur, all hands are called to their posts.

"The maritime laws of all countries should prohibit any steamers which did not carry an adequate complement of trained men, which did not possess an installation of twin screws, and which were not even constructed with double bottoms from regularly carrying passengers. These three requisites are necessary for efficiency as well as security—the inner hull is a complement of the second propelling engine, and the providing of an adequate complement is but simply the enactment of a just law preventing employers from overworking their help.

"It is a matter of experience that the best paying railroads are those which keep even in advance of the demands of their patrons. And so would it be in the case of ocean steamships if life-saving devices were employed before the law compelled their adoption. Every installation or change which had for its primary purpose the increased protection of the passenger would command the approval of the traveling public. The ocean liner which would make triple-screw installation its cardinal feature, would reduce to a minimum the chances of its ever becoming helpless. Once let it be known how safe and reliable is such an installation, and the best paying ocean passengers would not be content to travel on any other type of steamer."

ABRAM S. HEWITT ON THE COAL STRIKE.

Abram S. Hewitt recently celebrated his eightieth birthday in New York. For more than fifty years he has been active in public life. He was an authority on public affairs in 1840. He was consulted by the struggling iron companies of the Lake Superior region as early as 1852 as to the likelihood of congressional aid to stimulate the manufacture of iron in the United States. For more than half a century his clear and active brain has been exercised in the public behalf. Now he has, at the advanced age of eighty years, taken a hand in the great anthracite coal strike. When asked this week whether arbitration was not the only means that remained whereby the great strike might be ended and whether it was an equitable solution of the difficulty, he replied:

"You ask whether the time has not arrived for arbitration in order to end the coal strike in the anthracite regions. I think the time has arrived when the plain truth should be told as well to the striking miners as to the public from some recognized advocate of trade organizations as beneficial agencies for the improvement of the condition of workingmen. For a quarter of a century I have uniformly maintained the right and the duty of associations, both on the part of employers and employes. Such organizations, however, must be for lawful purposes and must look to the accomplishment of results founded on justice. When claims are made contrary to the fundamental conditions upon which society is founded, they must be resisted at all hazards. I am quite clear that the claims of Mr. Mitchell and the organization over which he presides are in contravention of the principles of free government and of the rights of men to earn their living in any lawful way without interference from organized labor or organized capital. The unhappy controversy now existing is not based upon any reasonable claim which labor can make for shorter hours or better wages. It is true that Mr. Mitchell alleges this to be the object of the strike, but as a matter of fact it is notorious that the real object is to secure the recognition of his national organization as an authority entitled to decide upon the rates of wages and the conditions of labor in the coal fields wherever situated.

"If this demand be conceded, it will not be possible for any man not holding a union card to secure employment in the coal fields. This will amount to a denial of the right of every man to sell his labor in a free market. The concession of this demand will make Mr. Mitchell the dictator of the coal business and put him in control of votes enough to decide the next presidential election.

"The right to labor is inherent in every human being and cannot be surrendered without the sacrifice of individual liberty and of private property. It therefore, cannot be arbitrated any more than the right of a man to his own home if it shall be claimed by an outsider who prefers arbitration. An offer of arbitration is always attractive, but there are many things which cannot be submitted to arbitration; among them none is so important to the workingman as the right to sell his labor in a free market. The operators cannot yield this point without being disloyal to the owners of the property and to the workmen who carry on the operations. It would be far better to abandon the business of mining anthracite coal than to concede the demand of any man or set of men to deny the rights of employment and of labor upon which the whole structure of free government is founded and to which this country owes its phenomenal progress. In my judgment, therefore, the operators are only doing their plain duty in declining to arbitrate a question which is in the domain of conscience and involves the personal liberty of the individual. The only solution of the trouble is for Mr. Mitchell to order the strike off without delay. When this is done, if there be grievances to be abated, they will be promptly adjusted between the local operators and the local unions. The right of association is not in question. This is admitted by both employers and employes. What is denied, and properly so, is the power by the issue of union cards to refuse employment to non-union men and thus condemn them to ostracism, starvation and death. Such a ruse is abhorrent to justice and is fatal to personal liberty.

"It is claimed in some quarters, and alleged to be the general opinion, that the operators ought to resume work without regard to the menacing conditions with which the anthracite coal mines are now surrounded. Such a position does not appear to me to be reasonable. As the owners of property, the operators undoubtedly owe a duty to the community, which is suffering great loss from the scarcity of fuel. The right of private property, guaranteed by the constitution, is always subject to the underlying principle that it is to be so used as not to damage the public seriously. Any claim of the operators, therefore, that they can do with their own as they see fit, does not rest upon a sound foundation. If, however, in the recognition of their duty to the public they are compelled to respect other fundamental conditions equally, if not more important to the public welfare, they would be false to their duty if they should yield to clamor and pressure from those who have not carefully considered the consequences of such action.

"There is a principle more important than the obligation of private property to subordinate itself to the general welfare. The demand of any man or set of men, not occupying public office, to decide upon the conditions upon which labor shall seek its living, and to make it subject to a license from irresponsible leaders, whether representing capital or labor, is in effect a claim to the power of life and death, and can never be conceded without a base surrender of duty to greed. The coal operators, therefore are not fighting so much for the control of their own property as for the right of the citizen to labor where he may find employment without interference from organizations or men who have no right to control this freedom of action.

"Finally, the claim of the United Mine Workers' organization to control the entire coal industry of the country is based upon an impracticable idea. Very little knowledge is necessary to show that the coal regions of the United States differ so much from each other that the policy which is adapted to one is utterly unsuited to another. Moreover, the various mines differ from each other in conditions, requiring careful adjustment on the wages of labor and in some respects in the hours necessary to keep them in working order. All that a national organization could possibly do would be to support the claim of workmen who for any reason are dissatisfied with the conditions which prevail in any particular locality or mine. But to call a general instead of a local strike when a local grievance is not adjusted in a satisfactory way is an outrage of such vast proportions that it cannot for one moment be tolerated by a free people.

"Moreover, in this day of free discussion and the publicity of all the facts through the newspapers, there is no possibility that any coal operator could or would resist demands which are founded upon justice. The coal mines are all under official inspection, generally by officers who sympathize, and properly so, with the miners. Any real grievance, therefore, will not only be promptly made known, but will be as promptly redressed when the questions at issue are discussed with good temper and free from the passions which are excited by a general strike throwing thousands of men out of employment.

"The consequences of such strikes are so disastrous, not merely to the parties directly concerned, but to the whole community, that every effort should be made as soon as the existing strike has been called off and the excitement is abated to prevent by appropriate legislation the recurrence of such calamitous conflicts, whereby everybody is injured and no one is benefited. The enactment of such legislation will not be attended with more difficulty than in the case of other disputes now regulated by law and subject to the judication of the courts. When the miners shall realize that they are making war upon their own rights secured by centuries of conflicts and sacrifices and that a present victory will result in depriving them of all personal freedom, such disastrous conflicts will cease to recur and arbitration may then well be invoked to settle local disputes.

"The hope of the working classes in the future, as in the past, for better conditions rests upon personal liberty and the security of property. The English-speaking miners understand this proposition perfectly, but for the time being they are powerless in the presence of bad leadership and the state of terror which prevails in the coal region, subjecting them to obloquy, violence and death, by which unwilling acquiescence is enforced. What is wanted to end this destructive conflict is not arbitration, but the stern repression of violence and the assured protection of the miners who desire to earn a livelihood for themselves and their families. To this protection they are entitled and the government which fails to afford it is a reproach to republican institutions. The demand for arbitration comes with an ill grace from a leader who began the conflict with an order calling on the engineers, firemen and pumpmen to abandon their task, thus exposing the mines to utter ruin. If this order had been obeyed the resumption of work would have been indefinitely postponed and the helpless victims of this desperate expedient reduced to hopeless poverty. 'To rule or ruin, is not a policy which commends itself to the American people, who believe in the old-fashioned rule that he who demands equity must first do equity."

ITEMS OF GENERAL INTEREST.

The application of the steam turbine to marine propulsion so far—with the exception of the two Clyde passenger steamers King Edward and Queen Alexandra—has been confined to pleasure and naval craft as distinguished from commercial ships proper. The Lancashire & Yorkshire Railway Co. now, however, has sent to ship building firms throughout Great Britain requests for tenders for a new steamer for the Irish sea service with alternative designs as regards the means of propulsion. Proposals are invited for the ordinary twin-screw reciprocating engines and also for steam turbine propelling engines. The speed desired is 17 knots.

The maritime board of trade, in session at Sydney, C. B., has adopted a resolution in favor of steel ship building, as it is desirable that Canadian products should be carried in Canadian-built ships. The federal government of Canada will be asked to grant a tonnage bounty large enough to enable Canadian builders to compete with American and English firms in this industry. The board will also urge upon the government the necessity of establishing a fast Atlantic steamship service between Canada and the United Kingdom, the ships to be equal in speed and appointment to any now crossing the Atlantic. The board strongly expressed itself in favor of government ownership of the fast Atlantic service.

THE NAVAL ENGINEER.

Views expressed by the Shipping World regarding the British naval engineer are equally applicable in the United States. The Shipping World says that the British navy is face to face with a grave danger, and thus discusses the subject:

"Time was when the drivers and conductors of the stage-coaches of England held places of affectionate esteem in the hearts of travelers. Their picturesqueness and jovial good nature endeared them to all, and long after they had become a spent force they were still admired, whilst their successors, the locomotive engine driver and the guard, were looked upon as intruders. But time has corrected the views of our fathers, and more than one stirring poem has been written to immortalize the heroism of the engine driver who, alone in his cab at the front of the train, in darkness, thunder and lightning, has piloted his stupendous charge through dangerous curves and places at a speed of from 50 to 60 miles an hour, sometimes sacrificing his own life in attempting to save property and the lives of his passengers. Who thinks of the dear old stage-coach drivers of a half century ago? No one, except when standing before the delightful paintings which represent the coach being driven successfully past pigs and dogs and nearing the inn under the gaze of admiring villagers. The day of the driver of the stage-coach is past; and so has the day of the sailor in the true meaning of the word. The sailor—the man who managed sails—left the ocean when masts and sails were removed from the ship. The captain of a warship in olden days, the master of a sailing ship of even twenty-five years ago, was a very differently trained man to him who now commands a mastless, sailless steamer driven by engines of enormous horse-power; and if this change be not recognized, and suitable action taken as a consequence, the body politic will surround itself with difficulties which will sooner or later expend national energy which might be more usefully employed. Let there be no mistake. The splendid old British sailor has disappeared from the face of the ocean. He will, however, never be forgotten in this island of seamen. He has gone with his masts and sails, and his place has been taken by the giant of the twentieth century, the engineer.

"How unpicturesque a person the engineer seems to many. Kipling's hero, MacAndrew, although immortalized to do justice to the zeal of the engineer, and to the importance of his profession in vessels propelled by steam, scarcely does justice to the modern engineer—sea-going or otherwise. The modern engineer is the essence of serious striving. Defeated, he tries again. He has achieved the conquest of the land and ocean. He now seeks to conquer the dominion of the air, and will, of course, succeed as motors improve. Yet this scholar, enterprising worker, and hero is more or less excluded from society because of his soiled hands. As if the Almighty gave His creatures hands merely to use at personal decorations, billiards, and cricket. Do these butterflies of social life, whose contemptible canons are carried by young officers into the army and navy, ever reflect what would become of the human race if hands were not employed? Can they not see that a few generations of such absolute idleness as they live in would restore them to the caves their forefathers emerged from—caves where, in idleness, without furniture or clothes, and in darkness, we can in imagination see them huddled together, fit companions for the anthropoid ape.

"The young giant of the twentieth century is, above all things, a worker. He does not desire to wear soiled clothes or to possess stained fingers; but he will consent to both rather than leave his task unaccomplished. Ought we to tolerate the teachings of society which, in the army and navy, find expression in such a way as to make those familiar with handicraft half ashamed of the profession to which they belong? Depend upon it, we, as a nation, are daily losing in manhood what we are gaining in fastidiousness; and the example of society, unchecked, will destroy the earnest, high-souled patriotism so necessary to the empire if Britons wish to maintain their ascendency among nations.

"We scarcely see eye to eye with the German emperor; but in some things he has set a splendid example to society. He has shown earnestness, a religious life, and has, we are told, learnt the art of cabinet-making. Something of this sort is required in Great Britain. A few leaders of society should become cabinet makers, electricians and engineers; and should not only cultivate a love of such useful employment in their own breasts, but should disseminate their views amongst their kith and kin. We now pass to marine engineers, by which title we mean naval engineers, as well as those serving in the mercantile marine. Unquestionably their importance on board sailless vessels has never been adequately recognized. Day after day scores of huge steamers leave our ports loaded to the 'Plimsoll mark' with articles of British manufacture, to be perhaps exchanged for raw materials of New Zealand or Australia. Blow high, blow low, not a stitch of canvas is seen upon them. In calm and storm, by day and night, the huge structures cleave the water under the resistless force of propellers driven by skillfully devised steam engines. The propulsive power is not now in sails; nor does the sailor walk the deck with anxious look to windward for squalls. His chief duty is to look ahead. He may be indifferent to squalls; their force is harmless. He dare not neglect right ahead, however, otherwise collisions may occur, and with them are danger and death. An entire change of conditions has occurred by the entry of the steam engine and its master.

"Behold in the bowels of the monster of the deep a half dozen huge boilers with dozens of cavernous furnaces which gape relentlessly at sweating firemen demanding additional food. They are relentless. Their cry is ever for more. When the process of digestion is finished, the boilers send the elastic nerve force forward to the engines to move the various limbs to which motion must be given. At the will or thought of their master the mighty engines move their limbs this way and that way as obediently as though made of flesh and bone; and when at last the vessel is free from the pilot and the difficulties of narrow waters, the engines take up their running and work with the rejoicing of the planets on their courses. Their orbits are indeed predestined, but they exert a magnificent stride, which never a steed approached, and hum with the music of engineering spheres.

"The master gazes serenely on his charge and in imagination sees the end and the beginning. From the hills he views the obtaining of metallic ores and 'black diamonds.' With the busy draughtsmen he can design the various parts of the vast machinery, and participates in their manufacture. He fits the machinery to the ship and fills the bunkers with coal. He raises steam, and at almost unbroken speed of engine passes a girdle round the earth, which means for the British Empire increase of wealth and creature comfort, and for the world at large an example of a splendid endeavor and free commerce. The sailor has gone; the driver of the mail-coach has gone. The engineer has come to stay; and the sooner those in authority recognize this, and make suitable provision for his happiness, the smoother will the machinery of government work to the benefit of all."

MISCELLANEOUS MATTERS.

Hall Bros., Port Blakely, Wash., have under way at their yards a four-masted and a five-masted schooner.

A new engineer chart in colors (No. 2) of the Apostle islands, Lake Superior, has just been issued. It may be had from the Marine Review Pub. Co.

A three-masted wooden schooner, the Frank W. Benedict, for Frank W. Benedict of New Haven, Conn., was launched last week from the ship yard of the New England Ship Building Co. Bath, Me. Her dimensions are: Length, 154 ft.; breadth, 35.3 ft.; depth, 13 ft.

Mr. Rodman E. Griscom of the International Navigation Co., writing to the Review says that it is the intention of the company to partially equip the Red Star liner Kensington with oil-burning apparatus as an experiment. Should this experiment be successful it will be potential in results.

The revenue cutter Tuscarora, intended for the great lakes service, was given her trial trip last week and developed a speed of 14¾ knots. Her contract speed was 14 knots. The trial was made off Old Point Comfort. The weather was fine and no sea running to interfere with the vessel's speed. Very little vibration was noticeable during the run. The Tuscarora is 178 feet long, 30 ft. beam, 15 ft. draught and has a displacement of 660 tons. The building price was $157,000.

The Vulcanus Forging Co. of Cleveland contemplate removing their plant to some other point and are open for propositions for a new location. The company employs between 200 and 300 men. The officials give as the reason for removal an unjust taxation, saying that their taxes have been raised 100 per cent., and that insurance rates have also been raised, which, added to labor troubles which are ever present, has decided them to remove from the city. They have plans drawn for a new plant and report that they will be ready to begin the erection of same as soon as a desirable location is secured.

Justice Shiras of the United States Supreme court says that arbitration is the logical method of settling labor troubles, such as the coal strike. He adds: "There is now one great difficulty standing in the way of arbitration. Many of the labor unions are not incorporated. Until they are no law can be made binding, as no contract or agreement could be forced upon them, while the operators on the other hand could be held liable. Incorporation of all labor unions is the primary step towards the passage of an arbitration law. The unions must be responsible for the carrying out of an agreement and until they are there is little hope for compulsory arbitration of labor troubles."

The Waterbury Brass Co., 122-130 Center street, New York, has ready for mailing (and it may be had for the asking) a new stock catalogue, classifying brass, copper, bronze and German silver in sheets, rods and wire, and also brass and copper seamless drawn tubing which they are carrying in their New York warehouse. The catalogue also illustrates stair treads and mouldings, brass ferrules and checks. The Waterbury company has also compiled a complete table of weights and measures bearing on brass and copper sheets, rods, wire and tubing. The catalogue has been gotten out at considerable expense and is said to be the most complete work of its kind ever issued.

ITEMS OF GENERAL INTEREST.

The navy department has accepted the torpedo boats DeLong and Wilkes. The former was built by George Lawley & Son of Boston and the latter by the Gas Engine & Power Co. and Charles L. Seabury & Co., Consolidated, Morris Heights, N. Y.

The Morsden Fireproofing & Construction Co. was incorporated in the state of New Jersey last week with a capital stock of $2,500,000 divided into $750,000 preferred and $1,750,000 common. Lewis Nixon, one of the organizers of the United States Ship Building Co., is interested in the enterprise.

Articles incorporating the Raab Iron Works Co. of Brooklyn were filed with the secretary of state on Aug. 25. The capital stock is placed at $15,000. The directors for the first half of the year are William H. Raab, George E. Hall and Ralph Raymond of Brooklyn.

Lieut. Lloyd H. Chandler, who commanded the torpedo boat flotilla in the naval maneuvers, and Lieuts. Rufus Z. Johnston, Jr., and Stanford E. Moses, commanding, respectively, the torpedo boats Biddle and Bagley, have been specially commended by Rear Admiral Higginson for their services in the naval search problem.

In the report of Rear Admiral Higginson, commander-in-chief of the North Atlantic squadron, on the naval maneuvers he says: "I take this occasion to urge that the department place upon all vessels of the navy a wireless telegraph outfit. In my opinion it is of incalculable value and no expense should be spared to hasten its adoption."

Experiments of the Oceanic Steamship Co. with fuel oil on the Mariposa seem to have been successful in every way. Lieut. W. P. Winchell who was on board the Mariposa on behalf of the navy department, is to report his findings. The trip from Tahiti to San Francisco was made in 10 days, 21 hours without accident of any sort and without any disagreeable features.

Mr. Clement Griscom, president of the International Navigation Co., has just returned from Europe. Asked when the Morgan shipping combination would be organized he replied that he did not know but thought that everything was in readiness for it. He added that there never was any probability of the merging of the Cunard line in the combination.

The Canadian government has contracted with Messrs. Elder, Dempster & Co., Furness, Withey & Co., Ltd., and the Allan line for the running of a line of steamships from Montreal and Quebec to Cape Town and one or two other ports which have not yet been decided upon. The vessels are to be fitted with refrigerating machinery and the sailings are to be monthly.

The board of inquiry which was appointed to investigate the accident on the submarine torpedo boat Holland at the Delaware Capes last spring has just made its report. The board finds that while it is impossible to determine whether the explosion was caused by gasoline or by the gas the preponderance of evidence was largely in favor of the theory that the explosion was caused by hydrogen gas from the storage batteries.

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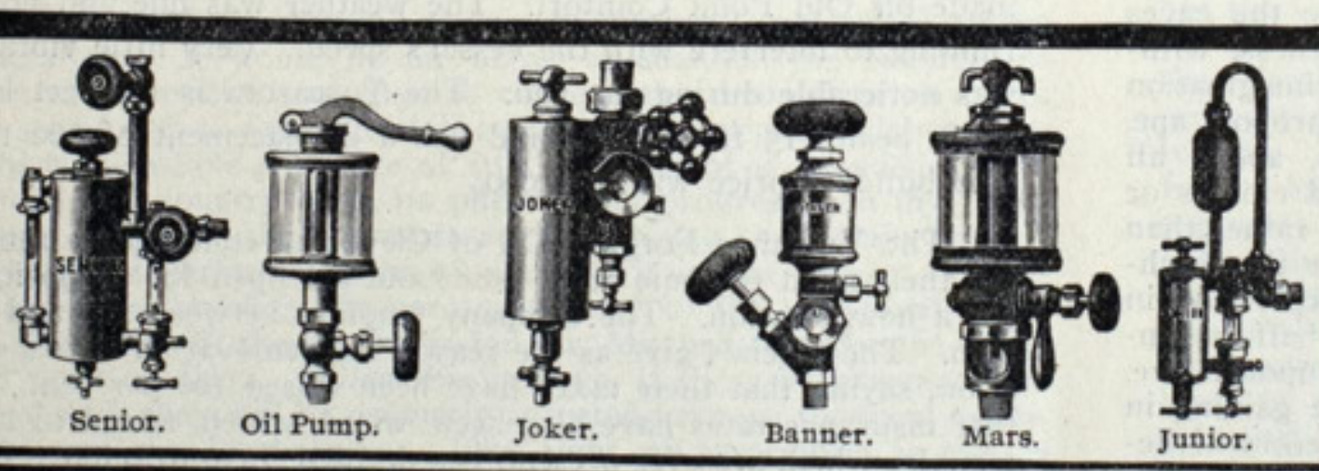

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